the Canadian Nurse

VOLUME 60 • NUMBER 3

MONTREAL

MARCH 1964

SERIES ON CARDIOVASCULAR CONDITIONS

OWNED AND PUBLISHED BY

THE CANADIAN NURSES' ASSOCIATION

'TERYLENE' *weaves the future into today's uniforms!*

Look crisp and feel fresh from morning till night, in uniforms made of Lux-Opaque 100% Terylene Taffeta.

by WHITE SISTER *of course!*



Lux-Opaque Terylene Taffeta
Style #0703 — short sleeves
To retail about $12.98
In sizes 8-18

Lux-Opaque Terylene Taffeta
Style #0707 — short sleeves
To retail about $12.98
In sizes 8-18

C-I-L / TERYLENE*

TERYLENE

*REGISTERED TRADEMARK. 'TERYLENE' IS MADE IN CANADA BY C-I-L



For more efficient oral hygiene Steri/sol ... the professional therapeutic mouth wash and gargle

New levels of achievement in the maintenance of oral hygiene are now possible due to the natural affinity of Steri/sol's active ingredient, hexetidine, for mouth tissues. Relatively unaffected by food and drink, Steri/sol maintains bactericidal and bacteriostatic activity for hours.

For bad breath, sore gums, minor oral infections or for sore throats due to colds, rinse and gargle with full strength Steri/sol. For prophylaxis and maintenance of a constant high level of oral hygiene, use Steri/sol night and morning.

WARNER-CHILCOTT
Toronto, Ontario

MADE BY THE MAKERS OF PERITRATE, SINUTAB, TEDRAL, GELUSIL

Between Ourselves

DR. GEORGES-ETIENNE CARTIER, a scion of the family of Sir Georges-Etienne Cartier, one of the Fathers of Confederation, was one of the very few Canadian pioneers, and the earliest French Canadian, in the field of peripheral vascular diseases. When he graduated in medicine and became associated with the Hôtel-Dieu Hospital of Montreal, in 1934, he had the choice of a career in internal medicine, general surgery, or allied specialties. Characteristically, he discarded those which were relatively well established and chose instead the one about which there was the least knowledge and the most confusion — circulatory disorders.

Dr. Cartier performed one of the first adrenalectomies in Quebec, and has had extensive experience in surgery of the adrenal glands. He was also among the first to operate on the sympathetic nervous system. Supported by 25 years of extensive medico-chirurgical practice, he has a broad knowledge of the entire scope of angiology; a refreshing vigor for his work; an infectious enthusiasm toward solution of problems; a persistent impatience with the unknown in medicine. His dissatisfaction with incomplete or uncertain knowledge raises problems for solution that form an inexhaustible backlog for research.

Active as a clinician and teacher he is particularly proud that, as a Canadian of French origin, he could participate in the French, Anglo-Saxon and American cultures.

To fulfill a dream of founding a centre where all types of circulatory disorders could be studied and treated in the best possible way, Dr. Cartier proceeded carefully in his choice of assistants and in the creation of a "milieu" within which circulatory phenomena would be the subject of dedicated and productive study. He had to fight for recognition and acceptance of his specialty, pursuing his ideals, ambitions and clinical investigative work with the most primitive means. In 1953, DR. PAUL CARTIER and DR. PAUL STANLEY joined him as cardiac and vascular surgeons; in 1960, DR. PAUL ROY, angio-radiologist, DR. JEAN DE L. MIGNAULT, cardiologist and internist, and DR. J. Y. MCGRAW, physiologist, pathologist and vascular surgeon were added to the list of specialists.

His assistants, colleagues and former students have respectful regard and affection for Dr. Cartier. The field of cardiovascular diseases, and of peripheral vascular diseases in particular, owes much to his skill for he brought order from confusion, and knowledge where ignorance existed before.

Dr. Cartier, and his colleagues have collaborated in planning the articles in this issue to present to Canadian nurses a panoramic view of the scope and range of Cardiovascular Diseases.

* * *

As you all know by now, this is the first time that the Association of Registered Nurses of Newfoundland has been hostess to our biennial convention. Away back when — the CNA held annual meetings, two or three affairs with an average attendance of scarcely more than one hundred.

The pattern was changed to every second year with the convention held in Ottawa in 1926. We have been asked for a listing of the places where subsequent biennial meetings have been held. Replying to that request, we wondered if there were others of our readers who might also be interested to learn of the pattern that has gradually emerged. Here is the listing by year, place and hostess association:

1928	Winnipeg	M.A.R.N.
1930	Regina	S.R.N.A.
1932	Saint John	N.B.A.R.N.
1934	Toronto	R.N.A.O.
1936	Vancouver	R.N.A.B.C.
1938	Halifax	R.N.A.N.S.
1940	Calgary	A.A.R.N.
1942	Montreal	A.N.P.Q.
1944	Winnipeg	M.A.R.N.
1946	Toronto	R.N.A.O.
1948	Sackville	N.B.A.R.N.
1950	Vancouver	R.N.A.B.C.
1952	Quebec City	A.N.P.Q.
1954	Banff	A.A.R.N.
1956	Winnipeg	M.A.R.N. & S.R.N.A.
1958	Ottawa	(50th Anniversary, CNA)
1960	Halifax	R.N.A.N.S.
1962	Vancouver	R.N.A.B.C.
1964	St. John's	A.R.N.N.

The trend is to return to any particular province about every twelve years. Where do you reckon the 1966 convention will be?

THE CANADIAN NURSE

March 1964, Vol. 60, No. 3

221 DIFFERENT, YET THE SAME *E. Rossiter*

223 THE WINDS OF CHANGE *R. Lefebvre*

224 VASCULAR DISEASES OF THE LIMBS *G.-E. Cartier*

233 CLINICAL INVESTIGATION IN PERIPHERAL VASCULAR DISEASE *J. Y. McGraw*

236 HEART DISEASE IN ADULTS *L. L. Lebel*

240 CARDIAC CATHETERIZATION *J. de L. Mignault*

243 ANGIOGRAPHY *P. Roy*

249 OPEN HEART SURGERY *P. H. Stanley*

257 ANESTHESIA IN CARDIOVASCULAR SURGERY *T. Cartier*

259 NURSING CARE IN CARDIOVASCULAR SURGERY *A. Audette*

270 SURGERY OF THE HEART AND LARGE VESSELS *P. Cartier*

277 CONGENITAL HEART MALFORMATIONS *A. Davignon*

279 INFANT CARE FOLLOWING CARDIAC SURGERY *J. Tanguay*

The views expressed in the various articles are the views of the authors and do not necessarily represents the policy or views of THE CANADIAN NURSE *nor of the Canadian Nurses' Association.*

194 BETWEEN OURSELVES

198 RANDOM COMMENTS

282 WORLD OF NURSING

284 ABOUT BOOKS

285 EMPLOYMENT OPPORTUNITIES

313 EDUCATIONAL OPPORTUNITIES

318 INDEX TO ADVERTISERS

Journal Board: Miss Alice Girard, Chairman; Misses M. Cameron, M. Lewis, G. Charbonneau, H. McArthur, M. Richmond, S. Alcoe, Mrs. I. MacLeod, Sr. D. Lefebvre, Miss E. A. E. MacLennan, president CNA; Misses H. Mussallem, M. E. Kerr.

Editorial Advisors: Alberta, Miss Jean Cummins, 1305 Montreal Ave., Calgary; **British Columbia,** Miss Marion Macdonell, 1807 West 36th Ave., Vancouver 13; **Manitoba,** Miss Sheila L. Nixon, 31-105 Roslyn Road, Winnipeg 13; **New Brunswick,** Miss Anna Christie, 231 Saunders St., Fredericton; **Newfoundland,** Miss Ruby Harnett, 59 Bennett Ave., St. John's; **Nova Scotia,** Mrs. Hope Mack, Nova Scotia Sanatorium, Kentville; **Ontario,** RNAO, 33 Price St., Toronto; **Prince Edward Island,** Miss Ida MacKay, Dept. of Health, Dominion Bldg., Charlottetown; **Quebec,** Sr. M. Elaine, St. Mary's Hospital, Montreal (English); Sr. Sainte-Barbe, Hôtel Dieu Hospital, Quebec City (French); **Saskatchewan,** Miss Victoria Antonini, SRNA, 2066 Retallack St., Regina.

Executive Director and Editor: Margaret E. Kerr, M.A., R.N.

Associate Editor: Jean E. MacGregor, B.N., R.N.

Assistant Editor (English): Virginia A. Lindabury, B.Sc.N., R.N.

Assistant Editor (French): Claire Bigué, B.Sc., Ed. Inf., I.L.

Circulation Manager: **Winnifred MacLean**

Subscription Rates: Canada and Bermuda: 6 months, $2.25; one year, $4.00; two years. $7.

Student nurses — one year, $3.00; three years, $7.00.

U.S.A. and Foreign: one year, $4.50; two years, $8.00.

Single copies: 50 cents each.

For the subscribers in Canada, in combination with the *American Journal of Nursing* or *Nursing Outlook:* 1 year, $10.00.

Make cheques or money orders payable to The Canadian Nurse.

Change of address: Four weeks' notice and the old address as well as the new are necessary.

Not responsible for journals lost in mail due to errors in address.

Authorized as Second-Class Mail By the Post Office Department, Ottawa, and for payment of postage in cash. Postpaid in Montreal.

RETURN POSTAGE GUARANTEED

1522 Sherbrooke Street West, Montreal 25, Quebec

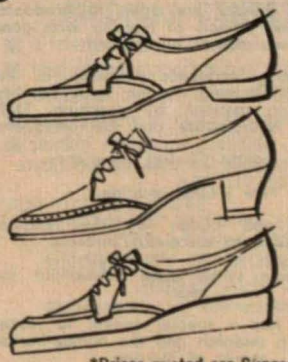


Wondersole is contoured to match the shape of your foot. Your body weight is distributed evenly along its entire length for complete support.

Air Step's new Wondersole cradles your feet with comfort every walking minute!

What a difference Air Step's new Wondersole makes to your general feeling of well-being. It lets you walk on the entire bottom of your foot instead of just the heel and ball. This allows you to walk and stand longer without strain.

For the name of your nearest Air Step dealer, write Air Step Division, Brown Shoe Company of Canada, Ltd., Perth, Ontario.



MEDIC $14.99*

WARD $15.99*

WONDER TIE $14.99*

Air Step®

THE SHOE WITH THE MAGIC SOLE

*Prices quoted are Suggested Retail Prices.

Air Step Division, Brown Shoe Company of Canada, Ltd., Perth, Ontario



THE NATIONAL HOSPITAL,

QUEEN SQUARE, LONDON, W.C.1., ENGLAND

(NEUROLOGY AND NEUROSURGERY) POSTGRADUATE NURSING EDUCATION.

One year courses are open to graduates of accredited Schools of Nursing with good educational background.

Three months academic teaching in the School of Nursing under guidance of Sister Tutor assisted by teaching Staff of Senior Neurologists and Neurosurgeons.

Eight months Clinical experience.

Five weeks vacation.

Certificate and badge of the Hospital awarded to successful Students.

Full graduate salary paid throughout the year.

This work has a special appeal to nurses interested in research and the human-itarian aspect of Nursing.

For prospectus apply to the Matron

Random Comments

Dear Editor:

Each month I borrow your magazine from one of my nursing colleagues and, in turn, make available physiotherapy journals. We find our views thus enhanced and enriched, enabling us to better understand our mutual concern — the patient.

The article by the Misses Rogers and Ballantyne (October 1963) was possibly intended for nurses only — who, indeed, have many and varied duties and persons to meet. I am one of those who care for "only that part of the patient which (s)he is treating."

We should all know more about the other's task. The skills may vary but, I believe, our basic qualities are alike. Who can say who has the more concern since our care is so interwoven.

Best wishes to your association.

M. L. Jayne,
British Columbia

Dear Editor:

I think this business of employing male nurses to care for female patients is disgusting and ridiculous and should be stopped.

Most female nurses say they wouldn't like it themselves — so why should we inflict this on the patients? In my opinion it is wrong to compare a male nurse with a doctor. A nurse spends much more time with the patient and has a completely different role.

As for male nurses taking OBS training, I think this is really inane. What woman in labor would want a male nurse caring for her?

I say let the male nurse take a more detailed training in urology and V.D. to equal the female nurse's training in gynecology and obstetrics.

(Mrs.) Eileen De Witt, Ont.

¶ *One male nurse recently stated, "Contrary to popular belief, the male nurses have no desire to nurse female patients."* Ed.

Dear Editor:

I would like to say how much I look forward to receiving each issue of the *Journal*. I share it with many of my Chinese friends who nurse here in Taiwan.

It would be nice to see a series of articles concerning nursing in other countries to inform Canadian nurses about the standards and aspirations of their foreign sisters, and to foster mutual respect and understanding among National Organizations.

(Mrs.) Mary H. Garvin, Taiwan, Free China.

Dear Editor:

Congratulations on a wonderful journal. To "R.N., British Columbia" (Jan. 1964): Please, please, do not start a campaign against "The Capping Ceremony!" After 43 years, I can look back with pleasure to the day I attended my own capping ceremony—after three months of hard work and study as a "probie." The superintendent of nurses (Director of Nursing, today) and the "powers that be" let me know that they thought I was nursing material and might continue training. What a day! We were on top of the world — at least for that day! Many nice things have happened to me since then, but I really feel this ceremony was the highlight — even more so than the presentation of pin and diploma.

My appreciation to M. L. Brown, N.B., for "A Hospital Night."

R.N., Québec

Dear Editor:

I wish to reply to "R.N. British Columbia" in the January issue of *The Canadian Nurse* who believes the Capping Ceremony to be "childish."

It is my contention that a nurse's cap is a symbol of her acceptance into our profession. To receive a cap after 3-6 months of preparation is recognition of much value to the struggling young student. Is it not more fitting that a symbol should be earned, rather than donned casually by the uninitiated?

The Nightingale Pledge is customarily taken at this time too. The students then feel that each day they are nurses learning to be better nurses for the service of mankind.

I, for one, would feel it a great tragedy to eliminate this moving and significant ceremony from the student nurse's life.

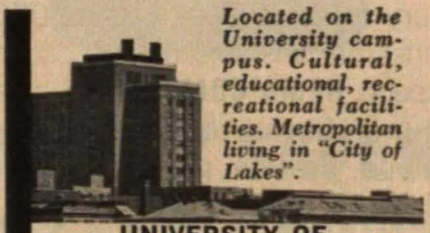
M. C. Herrington, Ont. and B.C.

Dear Editor:

In reply to the letter regarding the abolition of the capping ceremony:

I am a student soon to graduate from

The Physician's
antacid
Gelusil
• fast, lasting relief
• no acid rebound
• nonconstipating
• contains no laxative
WC WARNER-CHILCOTT
Toronto, Ontario


Located on the University campus. Cultural, educational, recreational facilities. Metropolitan living in "City of Lakes".
UNIVERSITY OF
MINNESOTA
MEDICAL CENTER
■ a friendly place to work
■ challenging opportunities for nurses
■ excellent patient-care facilities
■ wide variety of clinical services
■ nurses' residence available
STARTING SALARY: RN $400.00 PER MONTH
LPN $292.00 PER MONTH
FOR DETAILS WRITE:
DIRECTOR OF NURSING SERVICES
B-385-1 Mayo Bldg.
UNIVERSITY OF MINNESOTA
HOSPITALS
Minneapolis 14, Minnesota, U.S.A.

one of the schools in B.C., a school which is still "tradition-bound" in that, it has retained the capping ceremony. Even with the excitement of graduation I will always remember capping night when I became a full-fledged member of my school. This ceremony will be even more outstanding in my memories than the night I receive my diploma.

The capping ceremony gave all the girls in my class the extra "push" that, in some cases, may have been necessary. Friends of mine in other schools that have now abolished the tradition say they regret that the future members of their school should miss this ceremony.

I know no one was prouder than myself or my parents when I walked across the room to receive my cap!

A Student from a "Tradition-Bound School," B.C.

Dear Editor:

It disturbs me to see *The Canadian Nurse* continuing to advertise a postgraduate course in Neurological and Neurosurgical Nursing at the National Hospital, Queen Square, London, England.

I left a teaching position in British Columbia in August 1962, to take this course, with the hope that it would broaden my knowledge and understanding and make my teaching more effective. Professionally, however, it was a most discouraging experience and I would like to protect other Canadians from making a similar mistake.

Although I nursed in the hospital for almost eight months, I withdrew from the course a few months prior to leaving, but only after very careful consideration and great disappointment. Many specific illustrations could be given to support my opinion that the course offered at present is inadequate. Perhaps it is enough to say that unexplained delay of any classes or clinical teaching, as well as a negative attitude toward the course in many departments and in nurses who had recently taken or were taking the course, influenced me to make such a decision.

As you know, "Queen Square" is a famous institution and has, in the past, offered a most worthwhile course for nurses. In recent years, however, this course has undoubtedly deteriorated. It is hoped that something may be done to rectify the present situation.

R.N., B.C.



SPACE SAVER

This bottle contains 400 laboratory tests. It gives you 48,000 possible answers in 100 cc. of space. **HEMA-COMBISTIX*** is a dip-and-read test for urinary blood, protein, glucose, and pH. □ Ames Company of Canada Ltd., Toronto, Ontario.

CA 69564 AMES

*Trademark Reg.

REPRINTS AVAILABLE

The March 1964 edition of *The Canadian Nurse* is to be devoted almost entirely to Cardiology. The text will provide detailed information on the most modern developments in every aspect of medical, surgical and nursing care of patients with heart, arterial or venous lesions. All of the articles have been prepared by outstanding specialists in Montreal.

We propose to reprint all of this material in booklet form. Since the information is more up-to-date than any textbook on the subject, we urge that it become a required text for all students in our schools of nursing.

By ordering in large quantities we are able to offer very attractive prices for this booklet:

Single copies	—	50 cents
One dozen copies	—	$5.00
25-99 copies	—	35 cents each
Over 100 copies	—	25 cents each

Send your orders to The Canadian Nurse, 1522 Sherbrooke Street West, Montreal 25, Que., Canada.

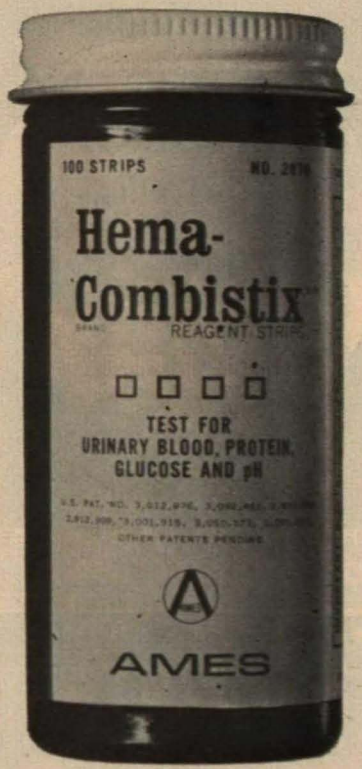
FILM LISTINGS

Now available for showing are "The Disordered Mind" series, originally produced for CBC television. These include:

1. A Coronary (psychosomatic conditions)
2. A Pathological Anxiety (psychoneurotic conditions)
3. A Depression (psychotic conditions)
4. A psychopath (anti-social personality disorders)
5. Obesity (psychosomatic conditions)
6. The Obsessive-Compulsive (psychoneurotic conditions)
7. Paranoid - Schizophrenic Breakdown (psychotic conditions)
8. The Compulsive Car Thief (anti-social personality disorders)

The consultant during the production of these films was Dr. H. E. Lehmann, clinical director of the Verdun Protestant Hospital and associate professor of psychiatry, McGill University.

Each film is 28 minutes long, in black and white. Available separately without charge for preview for purchase. Educational sale price: $150.00 each; rental: $10.00 per day. *Write to Canadian Film Institute, 1762 Carling Avenue, Ottawa.*



MONEY SAVER

Because **HEMA-COMBISTIX*** tells the story of urinary blood, protein, glucose, and pH in one minute, it has to save time. P.S. Time is money. ☐ Ames Company of Canada Ltd., Toronto, Ontario. AMES

*Trademark Reg.

In hemorrhoids
anorectal comfort
in minutes . . .

• Begin treatment with
Anusol-HC
(with Hydrocortisone acetate 10 m.g.)

• Maintain comfort with
Anusol
(suppositories and ointment)

Anusol will not mask symptoms of serious rectal pathology.

TORONTO ONTARIO

HOYER HYDRAULIC PATIENT LIFTER



TED HOYER & COMPANY, INC.
Dept. CN, 2222 Minnesota St., Oshkosh, Wis.

In the Good Old Days

(The Canadian Nurse — MARCH 1924)

In a London hospital is a card that says, "Remember the steam-kettle; though it is up to its neck in hot water, it still sings." The fighting spirit of a patient very often decides whether life or death is to conquer. There is no complaint from which there have not been miraculous recoveries. Try to make your patient think his case is one of these.

* * *

Two special trains toured the Province of Manitoba recently. They were known as "Better Farming Trains," organized for the benefit of rural Manitobans by the Department of Education. Nor was health education overlooked. To emphasize the importance of health in relation to agriculture, a passenger car (called the Better Health Car) was placed at the disposal of the Public Health Nurses' Department of the Provincial Board of Health. This coach was fitted up into lecture and consulting compartments, and a health exhibit with free literature was arranged, which attracted the attention of all who came to the train.

CANADIAN ECONOMY

The year 1963 was one of solid, if unspectacular, growth for the Canadian economy. It has been a year highlighted by the largest wheat crops on record, with sales to match, a significant increase in exports and more tempered growth in other sectors

Spending by individuals on goods and services is always the largest element in total demand; with rising personal incomes the consumer has played his full part in the continued upward trend of business. A key factor in the continued increase in consumer expenditure has been higher spending on durables, particularly automobiles Housing construction has been active, and in the first 10 months of '63 showed a 7% increase over 1962.

The value of Canada's exports increased sharply in 1963. In retrospect, it seems clear that devaluation of the Canadian dollar and an improved export picture have thus far gone hand in hand. Some products can now be priced more competitively in world mar-

kets. Furthermore, a substantial part of Canada's exports is represented by basic commodities sold at world prices and, with devaluation, such exports bring higher prices in terms of Canadian currency

Some of the export increases have resulted from more aggressive selling policies by Canadian manufacturers outside Canada. Still another factor has been the more buoyant economic conditions in Canada's major markets

At present, business faces the future with optimism tempered with some degree of caution and the judgment seems to be that the current expansion will continue its moderate rate of growth well into the new year.

Bank of Montreal *Business Review*

DIETARY COMMENT

Why is it generally recommended that highly seasoned foods be omitted from the diet when constipation is a problem?

If this is a general recommendation, it may reflect a failure to distinguish the nature of the problem. Refraining from use of spices and seasonings should have little effect in atonic constipation or constipation resulting from careless bowel habits. In treating spastic constipation it is assumed that irritants will tend to increase the reflex spasm of the smooth muscle. On this basis it is sound to avoid strong seasonings.

There is probably no harm in restricting seasonings in any diet for constipation (beyond loss of palatability). It may also be simpler from an administrative point of view for clinics and institutions to use a single diet sheet for constipation, regardless of cause.

— *Canadian Nutrition Notes,* Dec. 1963.

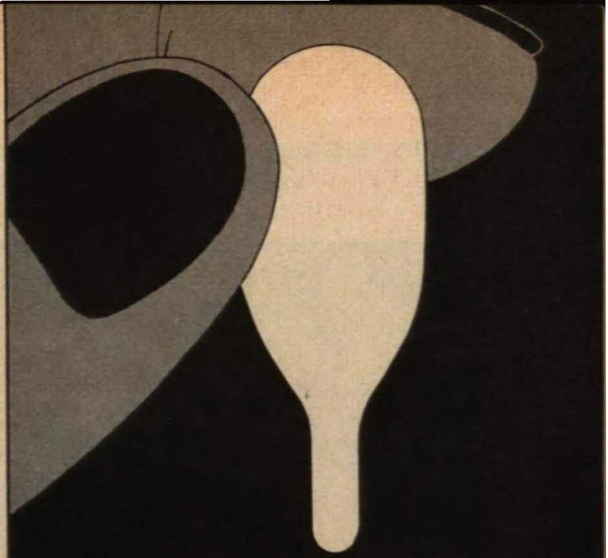
* * *

Today when something is not worth saying, they sing it.

— PIERRE-AUGUSTIN DE BEAUMARCHAIS

OUR APOLOGIES!

Erroneous information sent to the *Journal,* resulted in the inclusion of the name of Mrs. Mary (Rogers) Gorham in the "In Memoriam" column of the June, 1963 issue. A recent letter from Mrs. Gorham informed us of this error. She is very much alive and presently is working at Queen Elizabeth Hospital in Toronto.



NARISEPT

"DISPOSETTES"

SINGLE DOSE GENERAL PURPOSE ANTIBACTERIAL OINTMENT

A major break-through in the physician's effort to maintain sterile conditions and prevent undesirable sequelae in topical lesions has been made in the development of the new NARISEPT antibacterial ointment in handy "Disposettes" that eliminate the danger of re-infection from contaminated multiple dose containers.

Each "Disposette" (single-dose container) provides 900 mg. of ointment as—

Neomycin 3.5 mg.*
Bacitracin U.S.P. 500 units
Anhydrous Petrolatum ointment base . . . q.s.
(*equivalent to Neomycin Sulfate U.S.P. 5 mg.)

DIRECTIONS: Cut off soft, narrow spout-like tip and squeeze "Disposette" to direct ointment to affected area.

INDICATIONS: Use as a general purpose antibacterial ointment to prevent or treat infection such as may be encountered in abrasions, cuts, or minor burns or for nipple disinfection during breast feeding period. Also indicated for application on and around carbuncles and pimples.

HOSPITAL APPLICATIONS: Intranasally used as antiseptic, both in existing infection in the nose or in the destruction of organisms, as in asymptomatic nasal carriers.

PRESENTATION: 10 "Disposettes" in a unique sleeve type blister pack for one-at-a-time use.

INTRA MEDICAL PRODUCTS
DIVISION OF PENICK CANADA LTD.



CONSTIPATED!

take **PHENO-ACTIVE**

...for gentle, dependable relief without unpleasant reactions.

Each tablet contains:

Phenolphthalein	¾ gr.
Aloin	⅕ gr.
Ext. Belladonna, BP	1/16 gr.
Ipecac powder	1/16 gr.

DOSAGE: One or two tablets at bedtime. In obstinate cases, one tablet after each meal, then reduced to one morning and night. After regularity has been established, one or two tablets each night until condition is corrected.

Tubes of 25, bottles of 100 tablets

Charles E. Frosst & Co.
MONTREAL CANADA



with medicated

dermassage*

skin refreshant and body rub

On every ward, when you turn out the lights, some one wakes up . . . and wakefulness thrives on minor irritations. Skin discomfort, particularly, can disturb your patients during the nighttime hours. But as nurses in thousands of hospitals know, a body rub with Dermassage may add that one welcome touch of relaxation which tips the balance in favor of rest and sleep.

Dermassage comforts, cools and soothes tender, sheet-burned skin. It relieves dryness, cracking and itching and helps prevent painful bed sores.

You will like Dermassage for other reasons, too. A body rub with it saves your time and energy. Massage is gentle, smooth and fast. You needn't follow-up with talcum and there is no greasiness to clean away. It won't stain or soil linens or bed-clothes. You can easily make friends with Dermassage—send for a sample!

"SEE IF YOUR HANDS DON'T TELL YOU THE DIFFERENCE"

Now distributed in Canada by LAKESIDE LABORATORIES (CANADA) LTD.
1875 Leslie Street, Don Mills, Ontario

*trademark

instant ink-and-roller prints from a **disposable**

FootPrinter*

Hollister's Disposable FootPrinter with "Ready-Rolled"™ ink gives instant ink-and-roller type prints without messy ink-and-roller methods. We've already rolled the ink out for you, thinly, smoothly, and in just the right amount, so it's ready to use. You'll be especially pleased with the clear, black prints you get from this speedy one-use FootPrinter. Write today for a free sample and try it in your own delivery room. Ask for the Disposable FootPrinter by Hollister.



*with Ready-Rolled™ Ink

HOLLISTER® LIMITED
160 BAY STREET, TORONTO 1, ONTARIO


— say aahh...
Look into White Uniform oxfords by Savage. Better still, slip your foot into one. You'll say "aahh" (without any prompting) that's what you call comfort. And no wonder! White Uniform oxfords are made over the famous Hurlbut last and have special Krom-Flex leather soles that cushion every step. And they're treated with Sanitized® for lasting daintiness.
Choice of military or flat heels in a wide range of sizes and widths. All this comfort and style too. Available from your Savage dealer.
WHITE UNIFORMS by savage

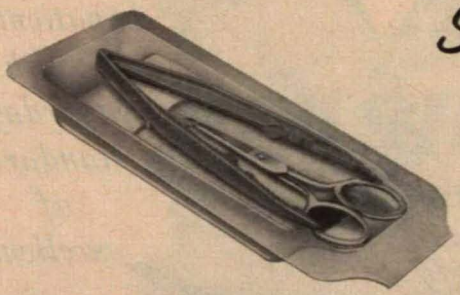


Just what the doctor ordered!

Jet South to Florida, Nassau and the Caribbean area for your holidays—and go TCA. It's the perfect cure for that common winter ailment: sick-of-snow complaint! You'll fly 9 miles-a-minute to the Sunlight Zone in a huge TCA DC-8 Jet...relax in your own armchair that's adjustable to your individual comfort... enjoy delicious, chef-cooked meals (compliments of TCA)...and, of course, spend practically every minute of your vacation having fun in the sun! You waste no time getting there, when you fly TCA. Check with your Travel Agent—or TCA for details of TCA's services South—TCA's 17-Day Economy Excursion Fares—TCA's Fly Now—Pay Later Plan and fund-stretching Package Vacation Tours. See your Travel Agent—or TCA—soon.

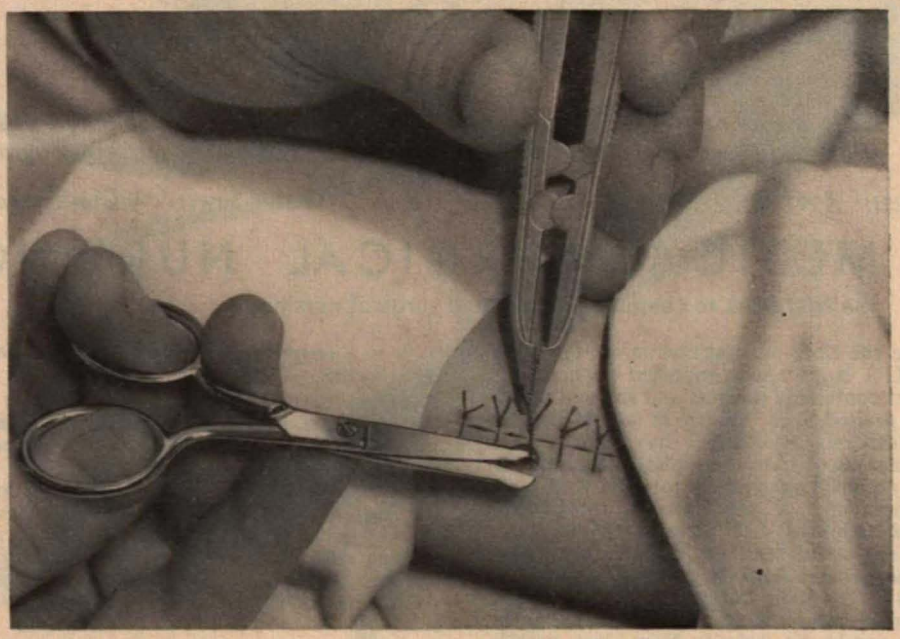
FLY CANADIAN—FLY TCA

TRANS-CANADA AIR LINES TCA ***AIR CANADA***



Sterilon **INTRODUCES THE ONLY SUTURE REMOVAL TRAY COMPLETE WITH METAL SUTURE SCISSORS!**

STERILE—
COMPLETELY DISPOSABLE



NEW CONVENIENCE AT YOUR FINGERTIPS

Here's a ready-packed complete Suture Removal Tray. Its Peel-Pak closure opens in a second, exposing scissors, forceps and gauze pad in a sterile tray, ready to use for any standard hospital procedure. All its components, including the metal suture scissors, are disposable, eliminating the expense of instrument upkeep, loss, and the danger of cross infection.

Sterilon Disposable Suture Removal Tray No. ST-600

Includes sterile forceps, gauze pad and uniformly sharp metal suture scissors for cutting wire, gut, silk or nylon sutures.

Sterilon Disposable Suture Scissors No. SS-1

Sterile scissors only in Peel-Pak package.

Sterilon **OF CANADA LTD. • 1700 LEWIS ROAD • NIAGARA FALLS, ONT.**

STERILON CORPORATION
Buffalo, New York

STERILON LABORATORIES
Fayette, Alabama



impatient with yesterday's standard of excellence

Only a text perfected through several revisions can have the standard of excellence to meet all of the requirements of today's school of nursing program.

New 3rd Edition!

Shafer-Sawyer-McCluskey-Beck

MEDICAL-SURGICAL NURSING

the first book to combine medical and surgical nursing

Since the time nursing instructors throughout the U.S. and Canada endorsed the concept of a text combining medical and surgical nursing, the praise given Shafer et al, MEDICAL-SURGICAL NURSING has been virtually unanimous. From the initial steps this text was designed specifically to meet your course requirements. It was warmly received and widely adopted. Less than three years later, this successful text was revised, **incorporating the suggestions made by many of the instructors using it.** It soon became the new standard of excellence by which all texts in this subject area would be judged. Now, less than six years after this concept was put into print, this popular text has been revised for the second time, and has been perfected further to meet all of the course requirements in today's modern school of nursing program.

Only a textbook tried, tested and perfected in classroom use can give you all the features offered in this new edition.

Why will this new 3rd edition satisfy *all* your needs?

1. It is a **comprehensive presentation, yet written with brevity.**

2. It has been **thoroughly revised to reflect rapidly changing theories** and procedures in both medicine and surgery. New material has been added, particularly in the sections on: the most frequently occurring disease conditions; the patient receiving radiation and chemotherapy for cancer; the endocrine system and nursing care related to therapeutic use of the steroids; alcoholism; head injuries; and methods of treatment of the heart and blood vessels.

3. It has features which make it **adaptable to a nursing problem-centered approach** and to a disease- or system-oriented approach.

4. It provides **clinical photographs of actual nursing procedures** integrated with the text material. This edition contains 50 new illustrations.

When the new 3rd edition is published later this year, examine it carefully and see how well it meets your requirements as an effective teaching tool for your classes.

By KATHLEEN NEWTON SHAFER, R.N., M.A., formerly Associate Professor in Out-Patient Nursing, the Cornell University-New York Hospital School of Nursing; JANET R. SAWYER, R.N., A.M., Instructor, School of Education, Department of Nurse Education, New York University; AUDREY M. McCLUSKEY, R.N., M.A., Sc. M. Hyg. Supervisor, Hamden Public Health and Visiting Nurse Association, Inc., Hamden, Conn.; and EDNA LIFGREN BECK, R.N., M.A., Associate Director of Nursing Education, Muhlenberg Hospital School of Nursing, Plainfield, N.J. To be published May, 1964. 3rd edition, 975 pages, 6½" x 9¾", 192 figures. About $8.75.

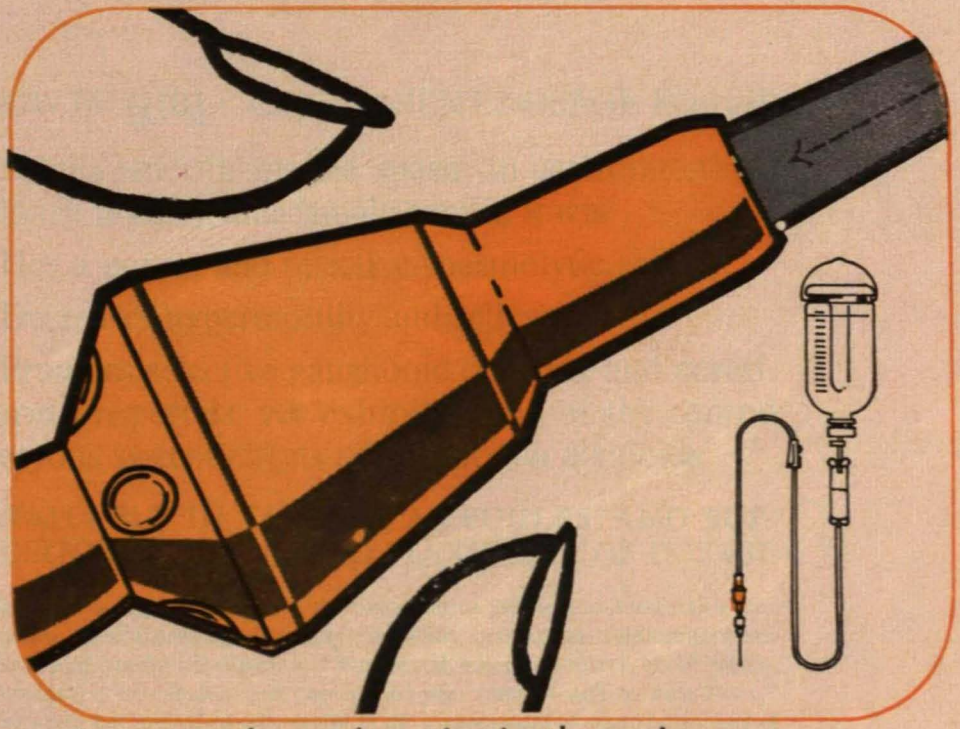
THE C. V. MOSBY COMPANY
3207 Washington Boulevard

MOSBY

Publishers
St. Louis 3, Mo.

squeeze it... release it!

FLASHBALL
device



—gives *visual* proof you're in the vein

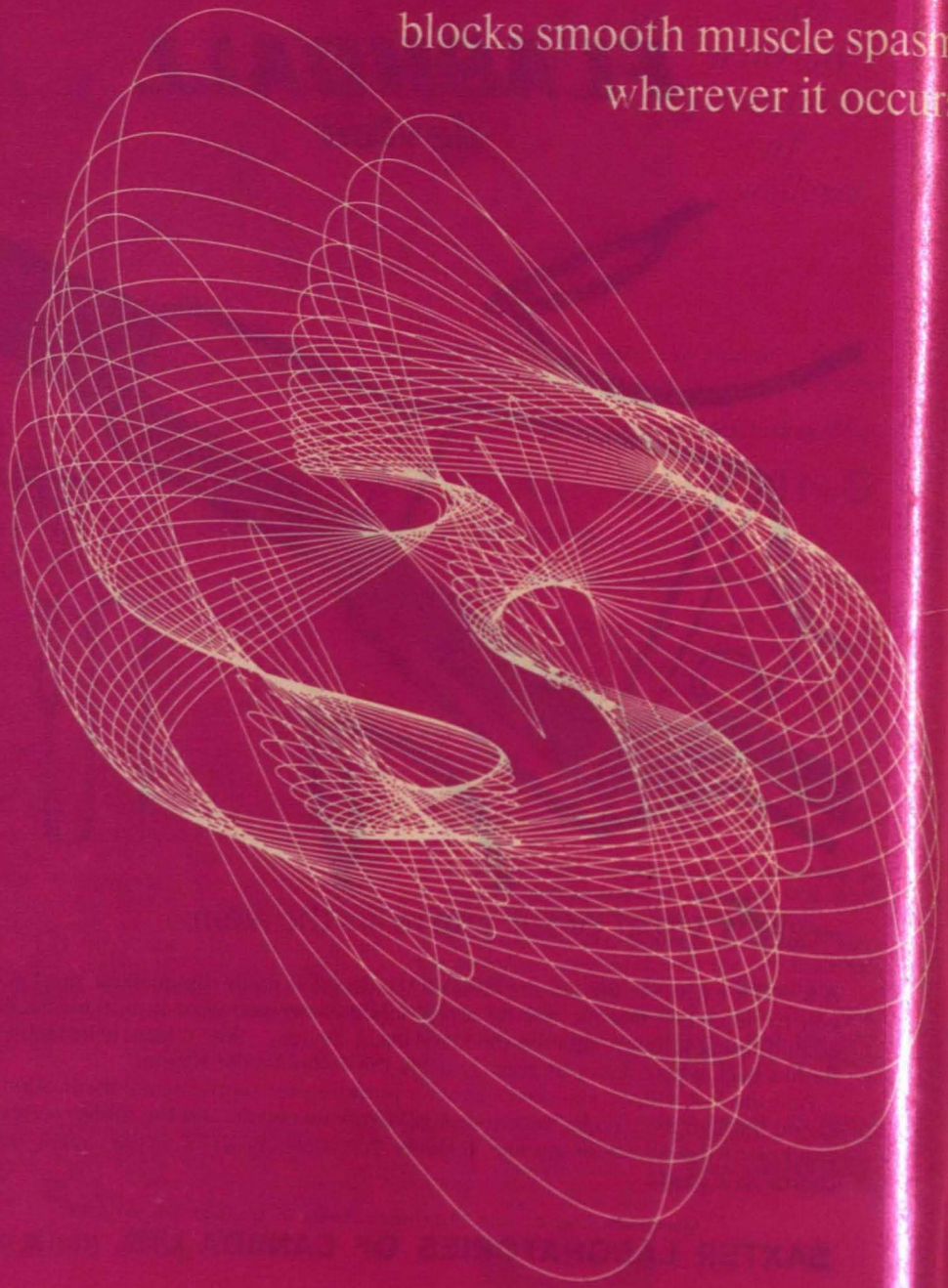
A BAXTER exclusive, the unique FLASHBALL device is easily the quickest, most accurate way to be certain that the needle is positioned where you want it: in the vein. Prior to administering solution, squeeze the FLASHBALL device... then release it. Instantly, blood flashes back where it can be seen... inside the nylon needle adapter.

And the FLASHBALL site serves another purpose—for supplemental medication introduced through the circular injection sites. Withdraw needle, and the rubber re-seals. Just another of the taken-for-granted features that make BAXTER PLEXITRON sets first choice in Canada.

Manufacturing Ethical Pharmaceuticals in Canada Since 1938

BAXTER LABORATORIES OF CANADA LTD. ALLISTON, ONTARIO

blocks smooth muscle spasm.
wherever it occurs



BUSCOPAN

(*N*-butylscopolammonium bromide, Parke-Davis)

NOW IN THREE CONVENIENT DOSAGE FORMS

- Blocks smooth muscle spasm in gastrointestinal, biliary, urinary, and female genital tracts
- Has a potent and selective spasmolytic action
- Decreases hypermotility and relieves pain
- Provides selective ganglionic blocking and curariform properties, yet exhibits none of the central nervous system effects of belladonna alkaloids

AVAILABLE IN TABLETS, AMPOULES, AND SUPPOSITORIES–FOR ADDED FLEXIBILITY OF DOSAGE

BUSCOPAN is highly effective in the treatment of gastric and duodenal ulcers, gastritis, cardiospasm, esophageal spasm, colitis, spasm of gastrointestinal carcinoma, and spastic constipation.[1-4] Functional biliary disorders, cholelithiasis, cholecystitis, cholangitis, and pancreatitis also respond well to BUSCOPAN.[1-3] This agent has proved equally useful in the management of spastic disorders of the genitourinary tract, and in urinary spasm accompanying instrumental intervention.[2,5] It relieves pain due to spasm in such gynecologic conditions as dysmenorrhea and adnexitis.[2,6,7] And it may also be used to suppress spasm in the lower segment of the uterus and cervix during delivery.[8] The usefulness of BUSCOPAN is enhanced by its virtual freedom from such side effects as sedation, dryness of the mouth, and visual disturbances.[1,3-6]

Package Information: BUSCOPAN is available as sugar-coated tablets of 10 mg., bottles of 100 and 500; 1-cc. ampoules of 20 mg/cc, packages of 10; suppositories of 10 mg., packages of 6.

References: (1) Lössl, H. J.: *München. med. Wchnschr.* (supp.) 94:653, 1952. (2) Birkner, F.: *Wien. med. Wchnschr.* 102:893, 1952. (3) Bass, E., & Dietrich, H.: *Deutsche med. Wchnschr.* 77:906, 1952. (4) Schmengler, F. E., & Köster, K.: *Med. Klin.* 47:121, 1952. (5) Kunz, A.: *Wien. med. Wchnschr.* 103:305, 1953. (6) Böning, H., & Kirch, A.: *Fortschr. Med.* 70:351, 1952. (7) Schmidt, J.: *Medizinische* 21:1293, 1952. (8) Corssen, G.: *Med. Klin.* 48:1286, 1953.

PARKE-DAVIS

PARKE, DAVIS & COMPANY, LTD., MONTREAL 9



The need to care for others

Always ready to understand, to help—the nurse is imbued with the patience and warmth demanded of those who aid the sick, the helpless, the very young. We are all indebted to the nursing profession for its devotion to the needs of others.

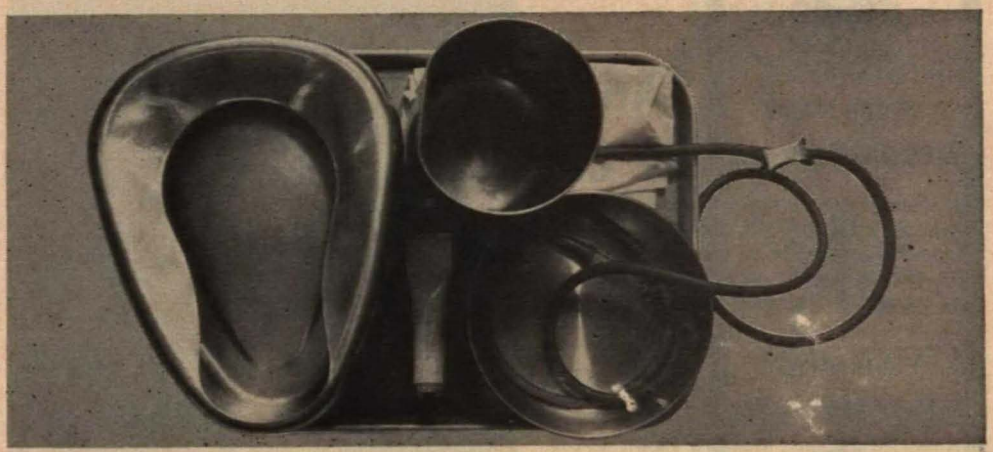


HEINZ BABY FOODS 57

BFM-263

DULCOLAX®

the laxative to replace enemas



The ability of Dulcolax to replace the traditional enema, not only in simple constipation but also in preparation for surgery and diagnostic procedures, has been well documented in the professional literature.

Dulcolax saves valuable time

The time required for Dulcolax administration is minimal compared to the enema administration and preparation and cleaning of enema equipment.

Dulcolax eliminates a distasteful task

Dulcolax tablets or suppositories are equal and often superior in cleansing action to enemas. With Dulcolax all but bedridden patients are able to use the toilet rather than bedpan and cleansing of soiled clothing, bed linen or dressings is rarely necessary.

Dulcolax spares your patients discomfort

Your patients will be extremely grateful to be spared the discomfort, embarrassment and inconvenience of an enema. Dulcolax results generally in one or two evacuations of soft, formed stool without violent purgation or exhausting straining.

Dulcolax tablets (enteric coated) 5 mg.
Dulcolax suppositories 10 mg.
Dulcolax suppositories for children 5 mg.

Boehringer Ingelheim Products
Division of Geigy (Canada) Limited, Montreal

B5066-64



CAREER OPPORTUNITIES IN CANADA'S ARMED FORCES FOR REGISTERED NURSES

Applications are now being accepted from Registered Nurses for enrolment as officers in the Royal Canadian Navy, the Canadian Army or the Royal Canadian Air Force for duty in the Canadian Forces Medical Service.

Interesting and challenging careers with opportunity for advancement are offered to those who meet the requirements.

YOU MAY QUALIFY IF YOU ARE

A registered nurse and a current member of a Provincial Registered Nurses' Association

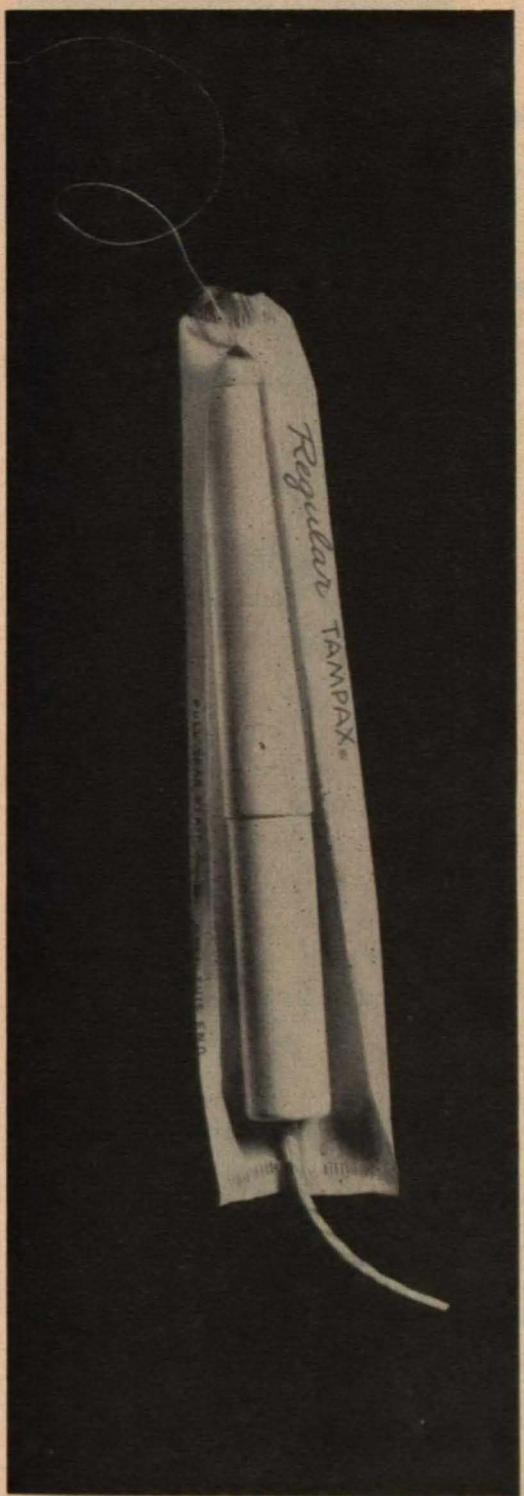
A woman under 35 years of age, single

A Canadian citizen, or other British subject with the status of a landed immigrant

FOR FURTHER INFORMATION—INQUIRE AT OR WRITE TO:

Your nearest Canadian Armed Forces Recruiting Centre or

SURGEON GENERAL
DEPARTMENT OF NATIONAL DEFENCE
OTTAWA, ONTARIO



Even the wrapper typifies Tampax convenience

Women dislike fumbling with cumbersome menstrual protection devices. At a time when nerves are already on edge, difficulties seem to magnify with the pin-pad-belt routine. Tampax, on the other hand, is immediately available for instant use — merely pull the handy tear-thread in the linen-paper wrapper and there it is, ready for simple, efficient insertion into the vagina.

This wrapper has hygienic importance, too. Not only does it assure complete cleanliness, but it enables the user to carry spares in her handbag, or special Tampax purse container, with assurance that they will remain hygienic right up to the moment of need.

Your patients will welcome the tidy convenience of Tampax and will soon recognize, as have millions of other women around the world, its many other advantages. With Tampax, the problem of menstrual odor is virtually eliminated. It is easily disposable by flushing away, as are the container-applicator tubes, so necessary for correct and easy insertion. Bathing and showering are made aesthetically possible. Even sitting and walking are more comfortable.

If you have patients who are having psychological or emotional difficulties over menstruation, perhaps you can ease their problems by recommending Tampax. Its use, comfortable and practical as it is, can improve a woman's or girl's whole attitude toward the complex of menstruation.

Tampax is available in Junior, Regular and Super absorbencies to meet the varying needs during the menstrual period.

Canadian Tampax Corp. Limited, Barrie, Ont.

TAMPAX

Internal sanitary protection for better menstrual hygiene

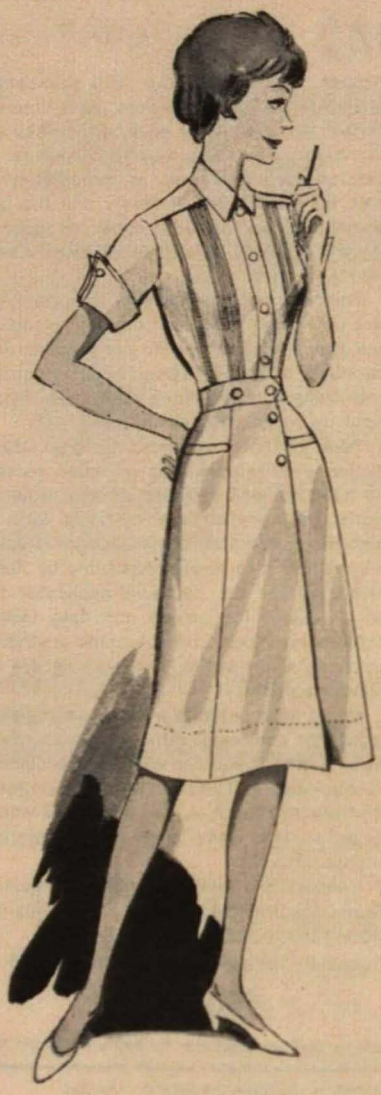
Canadian Tampax Corporation Limited
P.O. Box 627, Barrie, Ont.

Please send sample booklets (plus reorder card) and a set of the classic Dickinson anatomical charts (laminated in plastic for permanence) for use in explaining menstruation and tamponage to patients. No charge.

Name _____

Address _____

City _____ Prov. _____ CN 1



A Nurse with a frugal mind and purse, will always buy a

BLAND UNIFORM.

There are many reasons for this; namely: **STYLE,** and **COMFORT** and **LONG WEAR** are built into every uniform we make. They are made to give you satisfaction.

If you would like to have a catalogue, **just drop us a line.**

BLAND & CO.

1435 ST. ALEXANDER STREET,

MONTREAL, Que.



Beauty

begins with weight watching!

Weight control and general well-being depend on avoiding extra calories.

Using *Sucaryl* means you can keep an attractive silhouette, maintain your ideal weight—yet go right on enjoying fully sweetened, natural-tasting foods and beverages.

Sucaryl Sweetens Without Calories!

Sucaryl contains *no* calories at all. Whether you are just watching your weight, or are on a prescribed low-sugar diet, you can use *Sucaryl* in tablet, liquid or granulated form in cooking, freezing or canning, as well as in coffee and tea. It is not affected by heat or cold, has no bitter taste or after-taste.

Look for *Sucaryl* at your drug store—and ask for your *free* copy of the 32-page colour booklet, "Calorie-Saving Recipes with Sucaryl".



Sucaryl*

Non-caloric Sweetener

*Trade Mark Registered

ABBOTT

ABBOTT LABORATORIES LIMITED

Montreal - Toronto - Winnipeg - Vancouver

More than a substitute for mother's milk

SMA

NEW FORMULA S-26

Prepared formula for infants, Wyeth

- a physiologic replacement

A major achievement in prepared formula, S-M-A* New Formula S-26 is distinguished by:

- protein with a casein-lactalbumin ratio duplicating that of human milk — 40% casein, 60% lactalbumin
- physiologic renal solute load — to help the infant cope with stress situations (fever, diarrhea, vomiting, etc.)



Approaches the absolute standard in infant feeding — mother's milk — to provide:

- optimal growth and development
- minimal first-year complications
- excellent acceptance and tolerance

OUTSTANDING NUTRITION FOR ALL NEWBORNS

Wyeth

*Reg. Trade Mark

SUPPLIED: S-M-A LIQUID FORMULA S-26, 15 fl. oz. cans; S-M-A POWDER FORMULA S-26, 16 oz. cans. For a 20-calorie-per-ounce feeding, one ounce of liquid or one measure of powder (scoop in each can) to one ounce of water.

John Wyeth & Brother (Canada) Limited, Windsor, Ontario

THE CANADIAN NURSE

A MONTHLY JOURNAL FOR THE NURSES OF CANADA
PUBLISHED IN ENGLISH AND FRENCH
BY THE CANADIAN NURSES' ASSOCIATION

VOLUME 60 MONTREAL, MARCH 1963 NUMBER 3

Different, Yet the Same

When I entered our profession, more years ago than I care to admit, nursing was indeed a much simpler practice than it is today. It centred on bedside nursing and the skills involved in giving personal care, poultices, stupes, sponges, and watching with awe a blood transfusion being administered. Later, came the antibiotics and numerous other miracle drugs. Gone were the days of watching the temperature of a patient with pneumonia drop by lysis or crisis after many tepid sponges — a triumphant victory for nurse and patient after a wearing, anxious time for both.

One is apt to hear older nurses and members of the public say, somewhat nostalgically, "Nursing isn't what it used to be." A writer in this *Journal* has countered with "Thank goodness it isn't or nursing would be lagging behind the medical advances and social changes that have taken place."

Because of the rapidity of these changes, nursing must just as rapidly find the answers to many thought-provoking problems. To those charged with deciding what is good nursing care nowadays, and what numbers and



EDNA ROSSITER

kinds of personnel are necessary to give this care, the task is formidable. It is essential to find the answers if we are to provide the type of nursing education programs required and to attract suitable persons to the profession.

The Canadian Nurses' Association's programs and projects are planned and pursued to this end in the knowledge that we must compete with many other professions and occupations for a scarce number of well-qualified high school graduates.

A nurse nowadays must have a higher degree of technical skill and also possess greater ability as a leader in order to work smoothly with the varied members of the nursing team for whom she is responsible. She must have judgment to assess patients' needs which have changed dramatically, in many cases, from predominantly bedside care to rehabilitative and reactivation techniques. She needs a greater understanding of human behavior and an awareness of community health resources if she is to meet the patients' needs and expectations.

Has there been a need for change in her personal qualifications? Very little, I think. In the centre of a multitude of treatments, tests, medications, surgical procedures, x-rays, automatic equipment, health instruction and physical therapy is the patient — a *person* like ourselves. People are dismayed by illness or accidents. Their lives become changed. If they enter a hospital they are bewildered by its "busyness," the number of people around them, the unusual noises, their dependency on others and their loss of privacy. Many are concerned about their families, loss of income, the outcome of their illness and their ability to face pain and suffering.

Through empathy with our patients we must sense their degree of concern, see that they have adequate orientation to their new surroundings and the staff they will meet, create an atmosphere of confidence and encouragement, and enlist their cooperation through their understanding of the treatment and nursing care, remembering that present-day patients are much more knowledgeable.

"The person unfortunate enough to become a patient today is in danger of being subordinated to an environment weighted with the impersonality of technical gadgets and automatic controls. His individuality is in danger of being lost in the functional assignment of the hierarchy of nursing." (Thus wrote Marion Sheehan in the *American Journal of Nursing*, September, 1963). A chilling thought but true unless we as nurses remember that the purpose of nursing remains unchanged — to give treatment and physical care, to ease suffering, to encourage patients to progress to their fullest capacity of recovery, to teach good health habits and to encourage people to accept infirmities with equanimity. When the public, too, becomes aware of their changing nursing needs perhaps we shall hear them say "Isn't it amazing how nursing has advanced over the years!"

EDNA ROSSITER
Third Vice-President
Canadian Nurses' Association

A new "Cookbook for Diabetics," Canada's first, has been compiled by the Ontario Dietetic Association in collaboration with the Canadian Diabetic Association and has been published by Burns and McEachern, Ltd.

The book provides a full range of recipes, from hors d'oeuvres to desserts, all tailored to the diet needs of diabetics. It is intended to be used along with the Food Exchange Lists contained in the "Meal Planning" booklet now in the hands of most Canadian diabetics.

Cookbook for Diabetics is available at bookstores in paperback or cloth binding. Copies of the paperback edition only may be obtained by sending a money order or cheque (payable at par in Toronto) for $2.15 to: Ontario Dietetic Association, P.O. Box 313, Postal Station K, Toronto 12, Ont.

The Winds of Change

RODRIGUE LEFEBVRE, M.D.

During the past two decades, medical progress has completely upset traditional practices and perspectives in medicine as a whole, including the specialties. Cardiology and angiology have felt the effects of this, particularly within the last 15 years. Advances in these areas have been spectacular. Intensive study of pathological conditions and malformations of the heart and vessels have resulted from the development of new and daring techniques, frequently of a highly complex nature. Conditions that were formerly shrouded in mystery can now be diagnosed with extreme accuracy.

Clinical medicine has definitely retained its traditional value; scrupulous consideration of physical manifestations is necessary, obligatory and of prime importance. However, it must be admitted that modern techniques have made a major contribution to angiocardiology through expansion of areas open to observation and compensation of clinical deficiencies. For example, cardiac catheterization has become an indispensable factor in cardiovascular work. Its use has made possible the study of physiology of the cardiopulmonary circulation and has facilitated more thorough anatomical and functional diagnosis of acquired lesions, and particularly, congenital anomalies of the heart. Finally the effects of surgical intervention can be evaluated.

The radiologist has taken a foremost position in progress within cardio-angiology. Cardiac catheterization is dependent upon his skill and to this he has added angiocardiography, cinemato-angiography, aortography, arteriography. All of these techniques are extremely valuable and present precise information. Without their use, cardiovascular surgeons would be totally unable to carry out such painstaking, awe-inspiring and often life-saving procedures.

Surgeons, combining daring, skill and patience, have been able through the use of highly developed techniques, to contend successfully with valvular lesions and cardiac anomalies. Their achievements have been produced with or without the assistance of extra-corporeal circulation. They have been able to correct arterial stenosis, relieve obliterative vascular conditions, carry out vascular grafting and create bypasses. In each instance, major surgery is involved and patients are helped to avoid the possibility of hemiplegia, amputation, or the effects of arterial hypertension.

The extent of progess, and the steadfast determination, skill and daring of those who have made it possible are especially noteworthy. As in the case of any venture, there is benefit in "balancing the books" from time to time and seeing where we stand. It is in this spirit that we, as a group of specialists from Hotel Dieu of Montreal and Ste Justine's Hospital for Children offer this series of articles. It represents a survey of cardiovascular conditions as found in both adults and children, and includes methods of diagnosis and treatment; a consideration of the problems presented and the special care required. It is my belief that the information will prove helpful, stimulating and exciting.

Dr. Lefebvre is chief of the Department of Cardiology, Hotel Dieu Hospital, Montreal.

VASCULAR DISEASES OF THE LIMBS

GEORGE-E. CARTIER, M.D.

A study of vascular diseases, however brief, cannot be thoroughly understood, even by an experienced nurse, without a review, from a surgeon's viewpoint, of the dynamics of circulation and the structure of the vascular system.

BASIC PRINCIPLES

As it leaves the left ventricle, the blood gushes into the aorta, a large reservoir with few muscular fibres which is easily distended. From here, it flows out to the viscera, the head and the limbs through the arteries. These vessels have three layers: a very thin internal coat, the *intima;* a well-developed middle layer, strewn with muscular fibres, the *media;* an external sheath, which acts as a fibrous coat, and is comparatively loose-fitting and criss-crossed by small vessels, the *adventitia.*

The latter is innervated largely by motor fibres belonging to the sympathetic nervous system. These splay out into the media and carry the nervous impulses which trigger the constriction of the vessels.

Other nerve fibres, afferent and sensory, have a different action. Whenever an acute disorder in the volume or in the inner structure of the vessel occurs, impulses are telegraphed to relay stations, the paravertebral ganglia, and as far as the cerebral cortex. In response the circulatory system adapts itself to the different needs of the body through a dual phenomenon which takes place continuously throughout the system; vasodilation by a temporary or prolonged inhibition of sympathetic action which affects tonicity of the vessel and vasoconstrictive action arising from the reflex arc: the afferent fibre, the sympathetic ganglia and the sympathetic nerve. The artery is also directly affected by certain endocrine secretions, such as adrenalin, noradrenalin, acetylcholine and others.

The blood flows into increasingly smaller arteries and finally reaches the arterioles, similar in nature to the larger vessels but microscopic in size and strongly muscled. They are particularly susceptible to the nervous and hormonal action described. When contracted, blood flow downstream may be diminished to the point of complete stoppage; when dilated, the rate of flow is increased. Constriction will produce different effects according to the areas involved. Constriction of arterioles in the splanchnic area, will cause a rise in the diastolic pressure; of those in the skin, a reduction in skin temperature. On the contrary, vasodilatation lowers tension and produces skin warming.

The arterioles act as safety valves to protect the capillaries from undue pressure. The capillary has a special structure, since it serves as the junction between the arterial system bearing the nutritive elements and the venous system which carries away the body wastes. The capillary consists of an arteriolar branch with a very few smooth muscle fibres; a segment composed only of permeable endothelium and, finally, a venule, also poor in muscular fibres. The permeable endothelium of the capillaries is well adapted to allow nutritive exchanges at the level of the cell.

From here, the blood follows one of two paths: one of its components permeates the capillary vessel, forms lymph, and flows on through the lymphatics; the remainder of the blood follows its course through a microscopic venular plexus.

Dr. Cartier is chief of the cardiovascular diseases section in the surgical service of Hôtel Dieu of Montreal.

The color of the skin is associated with the circulation. The normal pinkish color arises from the reddish mass formed by the network of tiny vessels and blood showing through the transparent film of the skin. The tint varies according to the natural pigmentation of the subject. Nevertheless, a high blood count, especially if over 100 per cent of the normal, will give the skin a bright red flush, while a blood count under 30 per cent produces skin pallor. When studying people with normal pigmentation and hemoglobin, our interest centres chiefly on the color modifications resulting from the condition of the capillaries and the venular plexuses. When these vessels are contracted, the skin is white; if dilated, the skin becomes red. We must also keep in mind the local metabolism by which the blood gives off its oxygen and takes on CO_2.

When circulation slows down as a result of dilatation of the capillaries, the blood absorbs carbon dioxide, becomes darker in color and gives the skin a bluish tinge. The effect is more pronounced if circulation is completely arrested or extremely impaired. The capillaries are also extremely responsive to the vasodilator action of histamine.

Once the blood leaves the capillaries and the venular plexuses, it proceeds through increasingly larger veins, some superficial or subcutaneous, others deep-set in or between the muscles but all leading to the deep veins — the common femoral and the axillaries.

Some veins, like those of the limbs, are very long. To facilitate return flow of blood to the heart, a series of small valves distributed along the course prevent possible backflow, so that when a contracting muscle squeezes the vein, the blood is forced towards the heart. Like the arteries and arterioles, the veins, especially those in the extremities, are subject to the same nervous control inducing vasoconstriction and vasodilatation.

The venous blood flows on through the iliac and subclavian veins, empties into the inferior and superior vena cava, then reaches the right ventricle.

Finally, it is important to remember that the cutaneous circulation, especially in the hands and feet, is directly influenced by the surrounding temperature. This is particularly true when temperature falls below 22°C. (70°F.) or rises over 27°C. (80°F.). Muscular exertion calls for an additional supply of blood and, in turn, speeds up the return flow of venous blood through increased muscular pressure. When the limbs, particularly the lower ones, are in a motionless vertical position, venous return is slowed down. Such a position, however, and especially if it is a sitting position calls for little muscular work with a decreased blood supply.

Once these fundamentals are understood, the more frequent forms of vascular diseases that a nurse will encounter in the course of her career may be reviewed. Knowledge of the mechanics of these diseases, will enable her to understand and comply with the physician's instructions.

VASCULAR DISEASES AND THEIR TREATMENT

The approach to this subject departs somewhat from conventional methods since the viewpoint is primarily clinical. Circulatory diseases are classified according to their common characteristics, then studied in relation to their clinical importance.

The most common vascular disorders are dealt with first:

arteriosclerosis and Mönckeberg's sclerosis, with or without diabetes; Buerger's disease or thrombo-angiitis obliterans; varices, phlebitis and lymphedema. These are followed by a discussion of true and false aneurysms; arteriovenous communications; angioma. The subject of vascular diseases marked by vasomotor disorders occurring primarily in the arterioles and the capillaries, and secondarily in the larger arteries is touched upon. Having mentioned briefly a few rare diseases, we will touch on the behavior of the circulatory system in trauma. The two major arterial diseases are arteriosclerosis and Buerger's disease.

Arteriosclerosis

This is distinguished by a special lesion of the intima: the atheromatous plaque. This plaque is a compound of scar tissue and lipid substances in various proportions, depending on the spot and the patient involved. The arteries

of men or women, especially those past their 50's, can be affected by this disease, which is the deadliest killer of modern western man.

It has a marked preference for the cerebral and coronary arteries, the terminal aorta, and the arteries of the limbs.

The atheromatous plaques may unite to form large areas which line the inside of the arteries, forming cylinders of varied thickness, with projections and uneven surfaces that cause narrowing of the lumen. The effects of this narrowing are not felt by the patient as long as there is no increase in the blood requirement. However, when the muscles are active, as in a brisk walk, they require more oxygen and nutritive elements. In the patient suffering from arteriosclerosis, the reduced caliber of the arteries produces ischemia, that is, an insufficient blood supply and the muscle expresses its need through cramping pain. The pain may be felt in the foot, the calf, the buttock or the hips. It occurs only while walking and is called *intermittent claudication*. It is the pathognomonic sign of an insufficient arterial supply.

Complications: The most frequent are:

a. *Arterial embolism,* an acute arterial obliteration caused by a clot or plaque carried downstream from the heart or the aorta;

b. *thrombosis,* in which a clot develops in situ and affects large or small segments of the artery.

The first result of obliteration, is, of course, immediate obstruction to blood flow in the artery involved. In addition there is stoppage or at least slowing down of circulation in the collateral vessels as the result of reflex constriction, which lasts for a variable period of time depending on the individual. The ensuing symptoms are easily understood:

numbness, paleness and lividity, coldness and paresis beginning at the extremities. If the patient is fortunate, collateral circulation will be restored and blood will reach the temporarily starved tissues. This happens more often than we think. Many a patient has been the unwitting victim of one or several segmentary arterial thromboses which were treated as a rheumatic condition or some other disease, before an emergency operation became necessary. All too often, results are much different. The reflex spasm persists and aggravates the already threatening ischemia, until severe pain or even incipient gangrene forces the patient to call on the surgeon's skill.

Treatment: The method depends upon the symptoms presented and the region involved. In obliteration of the aorta and of the iliac arteries, the treatment of choice is thromboendarterectomy, or, more often, a graft using synthetic tubing. In conjunction with this operation, a lumbar sympathectomy is recommended. Obliteration of the superficial femoral can be relieved remarkably by this same operation. It has even greater significance when there is obliteration of the popliteal and other arteries in the legs, since at present there is no method of local intervention in these areas. In the femoral arteries, however, thromboendarterectomy, in some cases, or a venous graft taken from the internal saphenous will give good results.

In elderly arteriosclerotic patients, 70 years old or more, where arterial lesions are disseminated throughout the limb, sympathectomy is doomed to failure. At the Hôtel-Dieu, we have succeeded in preserving arteriosclerotic limbs from six months to a year or more with a rarely used treatment: intra-arterial histaminotherapy. Sometimes this treatment alone is sufficient, although there have been instances where sympathectomy brought success in histamine treatment which would have given no results otherwise.

To summarize, intermittent claudication, when treated at the outset before the effects of impairment are too advanced, is frequently relieved by the administration of vasodilators. Even in advanced cases, this treatment is more beneficial to the patient than reports generally lead us to believe.

Mönckeberg's sclerosis and calcification

This is a special form of arterial lesion affecting the media that is usually classified with other types of sclerosis despite its special location and its own special clinical characteristics.

We know that diabetes may or may not accompany both of these conditions. In caring for the elderly, diabetic patient with arteriosclerosis, we

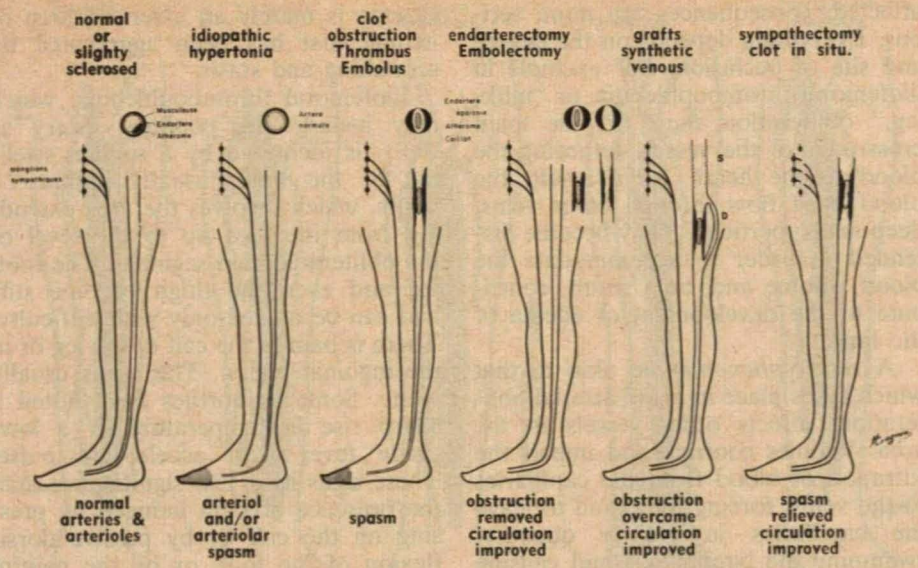


Fig. 1 Arterial conditions, treatment and outcome

tend to speak improperly of diabetic arteritis, which is incorrect pathologically. One thing is certain, however. The wounds of diabetics do not heal as easily as those of the non-diabetic. It is essential to find out first whether or not the arteriosclerotic patient is diabetic.

Thromboangiitis obliterans

This is an inflammatory disease leading to thromboses. It affects arteries and veins and occurs most frequently in young males, 30 to 45 years old. Usually the lower limbs are involved. Sometimes there is a long history of superficial phlebitis of the legs affecting different regions in turn, hence its name migratory phlebitis.

The presence of arterial disease is determined by intermittent claudication or discovered by a chance wound in a toe. This disease is particularly distinguished by *its extreme tendency to become much worse as long as a patient continues to smoke.*

Treatment: The first phase, obviously, is to avoid the use of tobacco in any form. Lumbar sympathectomy always gives good results by suppressing minor difficulties at the onset and arresting progress if the disease is well established.

European surgeons have used and are still using adrenalectomy in Buerger's disease. We have sometimes used this technique, and we may again.

No fine line separates the appearance of arteriosclerotic symptoms, and the development of Buerger's disease. Both conditions may exist in the same patient. Consequently, in addition to the routine of therapy already outlined, the possibility of grafting or of thromboendarterectomy must be considered.

Varicosities, Phlebitis and Lymphedema

Once it has entered the limb, blood may encounter difficulty in leaving for a variety of reasons. In varicosities, there is loss of venous tone and the vessel becomes uneven in caliber, with the result that the valves become defective in the superficial and connecting veins by which deeper veins are reached.

In acute thrombophlebitis there is obliteration of an entire segment of a vein, superficial or deep-set, possibly in a significant location. If the affected vein is superficial, the collateral vessels will ensure return blood flow, with no more discomfort to the patient than the pain. However, if a deep vein is

affected, consequences are more serious. Everything depends on the degree and site of occlusion. For example in iliofemoral thrombophlebitis, or "milk-leg," obliteration shuts off the main crossroads of the vessels returning the blood to the heart. As a result, the blood must flow through other veins, deep and superficial. They become distended in order to accommodate the blood volume and, as a result, contribute to the development of edema of the limb.

A *reflex phenomenon*, akin to that which takes place in acute arterial obliteration, affects other vessels in the area. Venules contract and impair the filtration of blood from the capillaries to the veins, forcing the liquid to leave the capillaries in greater quantity, swamping the lymphatics, and causing edema. It may be assumed that in the lymph glands or along the course of the lymphatic vessels, reflex constriction also takes place, further impeding the return flow.

Leriche reported in 1933 that he had caused phlebitic edema to regress by anesthetizing the sympathetic lumbar ganglia, proving that the edema concomitant with deep thrombophlebitis was of vasomotor origin.

Two severe complications may modify the course of iliofemoral phlebitis: *Spasm of a neighboring artery*, resulting in pronounced ischemia of the distal end of the limb. This is the blue phlebitis described by Gregoire; thrombosis which spreads out from the point of origin, invading tributary veins, producing extensive thrombophlebitis.

In summary, a varicosity is an abnormally elongated and dilated vein characterized by inefficient valve function, sometimes of a temporary nature but, more often, permanent. Besides disfigurement of the limbs, the patient experiences fatigue and sometimes pain after standing or sitting for long periods. Walking may alleviate this pain.

One additional complication is to be feared — varicose ulcer. This may appear following rupture of a small varicosity or subsequent to trauma and necrosis of an already poorly drained region, but in most instances it is the result of scratching. Perivenous sclerosis and a distinctive ochre pigmentation are also common signs. Varicose eczema is merely an extended area of itching that has been aggravated by scratching and stasis.

Iliofemoral thrombophlebitis, which may include the popliteal artery as well , is identified by a sudden swelling of the limb, usually within 24 hours, which involves the area extending from the toes up to the level of the obliterated vein segment. The foot, leg and even the thigh become stiff and can be moved only with difficulty. There is pain in the calf of the leg or in the inguinal region. The leg is usually white. Some authorities have noted a sharp rise in temperature or a low-grade fever with accelerated pulse. These signs have less significance than the presence of pain induced by pressing on the calf or by passive dorsiflexion of the foot, or by the painful bloating in the inguinal region when pressure is applied to the common femoral artery. Equally revealing is the appearance of a superficial network of veins over the obliterated region.

There is another form of phlebothrombosis in which the thrombus is partially attached to a few millimeters of the vein wall, with a projecting "tail" drifting in the blood stream. This floating thrombus may, at some time, leave its anchorage and cause pulmonary embolism. It is most important to determine or at least suspect its existence in the only way possible, that is to think of it. In patients who are recently postoperative, postpartum, or who have a cardiac condition, we must be alert to the presence of small but significant signs, such as pain when pressing the upper region of the heel; pain in the calf if clasped with both hands; pain in the calf and the popliteal cavity if the foot is subjected to passive dorsiflexion. Whenever all or some of these signs are present in a single leg and are new to the patient, phlebothrombosis must be suspected.

In thrombophlebitis, the clot acts differently. It is firmly attached to the wall and to the point of discharge of the vein tributaries. It does not usually cause embolism unless, of course, a drifting type of thrombus develops at its extremity. This rarely happens.

Complications: Superficial phlebitis is usually self-limiting. However, when it extends towards the sapheno-femoral

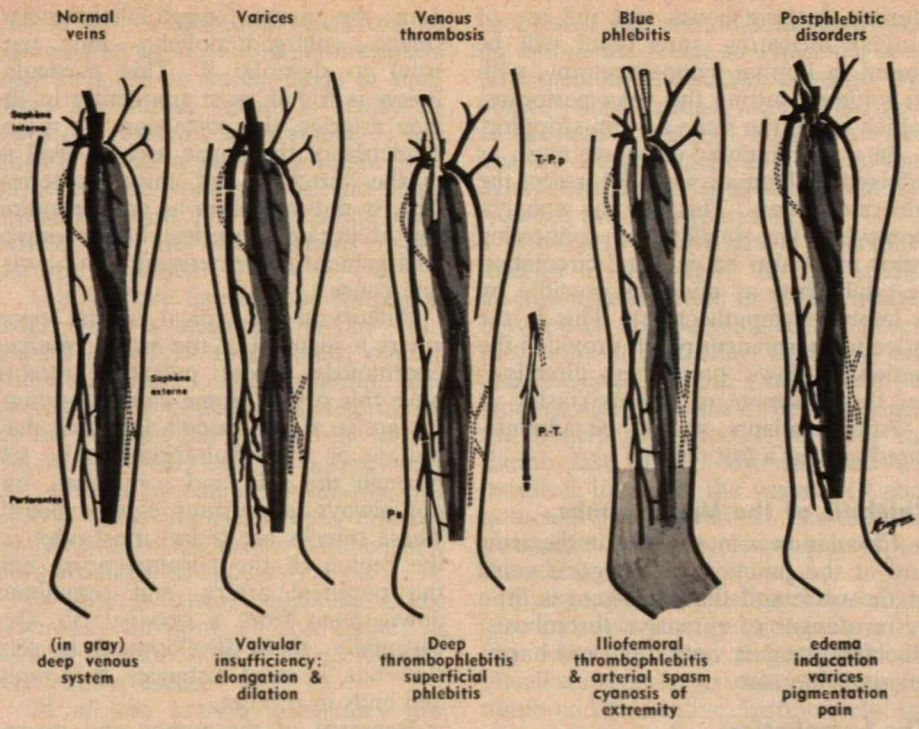


Fig. 2 Venous circulation of lower limb and main abnormalities. Venous blood flows from the extremity towards the origin of the limb, from the peripheral to the deeper vessels. The valves (indicated as tiny white spaces) prevent backflow; when deficient, blood tends to flow towards the periphery of the extremity, elongating and dilating the veins.

junction there is the possibility of deep-seated thrombophlebitis with its attendant problems. Pulmonary embolism is a possible threat although we have never encountered such a case. Although not always fatal, its death toll is most impressive.

The iliofemoral type of thrombophlebitis breeds immediate and long-range complications. The first short-range complication is the so-called blue phlebitis which can produce ischemia of the limb and consequent gangrene, so severely and so quickly that many limbs and even lives have been lost.

Extensive thrombosis which causes cyanosis of the thigh, the knee and even the leg, excluding the foot, is always concomitant with a pronounced decline in the patient's general condition and may bring death.

The major complication of iliofemoral thrombophlebitis, is not noticeable at the onset. As a whole, postphlebitic disorders include pain, varices in the legs, edema, sclerosis and induration. When an ulcer develops on this hardened plaque, usually inside the lower part of the leg, we are witnessing the last of the sequelae related to deep thrombophlebitis.

The foregoing discussion leads to a simple conclusion concerning the basic treatment for conditions of the venous system: prevent circulatory stasis. This aphorism was clearly and comprehensively formulated by John Homans in 1939. The following year, we introduced it into Canada. Others have attempted to tag it as a personal discovery by giving it the title "new way of life."

When varices are not too numerous, sclerosing injection therapy should be sufficient; if too painful, surgery becomes necessary. Small varicose ulcers heal readily and permanently after operation; large ulcers require resection and skin grafting.

If induration and postphlebitic pain are not adequately relieved by wearing elastic stockings, elevating the legs

during sleeping hours and the use of similar measures, sure relief will be found in lumbar sympathectomy, with or without cutting the vena perforans, which is not the same as vein stripping.

In a postphlebitic ulcer, we must, as advised by Homans in 1939, resect the ulcerated area. This is not enough, however. The inadequate connecting veins must also be cut, and circulation re-established as much as possible by a lumbar sympathectomy. This is the price for permanent relief, provided the patient follows prescribed directions for the treatment of venous stasis.

Anticoagulants, should be administered only as a last resort.

Phlebitis of the Upper Limbs

Circulation is more rapid in the arms and at the junction of the great veins of the neck and thorax. There is little or no danger of extensive thrombosis. The treatment is simplified and harmful sequelae rare.

The Lymphatics

One of the more spectacular diseases of the lymphatics is elephantiasis. This disease is rather rare and fortunately can be partially cured by special operations such as the Kondoleon method or the Servelle modification of it.

There are other forms of lymphedema, the cause of which was thought to be dilatation of the lymphatics but which in our opinion, was simply a belief accepted through habit and reprinted from one text to another. Recently, we have submitted such cases to lymphangiography and found that the lymphatics show no anomaly. The trouble lies in the superficial veins which are too fine or abnormally constricted. Patients, usually female, who are afflicted with large legs cannot hope for any surgical treatment. As yet, no better cure is available than to follow the standard rule for prevention of stasis.

Aneurysm, Arteriovenous Fistula, Angioma

The arterial diseases in which the lumen of the vessel is reduced are balanced by those characterized by an enlargement of the canal. For instance, there is a type of arterial lesion the dimensions of which led Leriche to coin the name "megadolichoartery" (mega-, enlarged; dolicho-, long, narrow) to describe it. This particular lesion is found most frequently in the iliac arteries, the aorta and the major branches of the aortic arch as well as in the vertebral and carotid arteries. This is not dilatation as compensation for obliterated arteries, but a simple enlargement and extension with no visible cause.

Aneurysm is a typical arterial lesion where a segment of the artery enlarges enormously. Most pulsating tumors have this origin. Some cancerous tumors are so richly vascularized that they pulsate as well. Pulsation can be felt through the skin and sometimes, but not always, a murmur can be heard. These tumors are found most often in the region of the terminal aorta and the popliteal artery, and sometimes downstream from a cervical rib. Occasionally, their development is very slow but, in most instances, it is rapid and ends in rupture.

Removal of the tumor and its replacement by a synthetic graft is the most common treatment, even if not systematically followed.

Other tumors, very much like those just mentioned, are called false aneurysms. More properly they should be called "pulsating hematomas." These are true hematomas, inasmuch as they originate from a ruptured artery. Occasionally, rupture is the result of necrosis of the wall owing to bacterial infection. More often it is caused by an accidental wound such as a bullet, a knife, or a violent blow from a metallic object. The artery spills blood into the surrounding soft tissues, where it accumulates. An inflammatory reaction arises on the outer edge of the wound and develops into scar tissue. This extends to the edges of the wound and forms a pocket of blood which is connected to the lumen of the artery. The latter explains why the hematoma pulsates. Hematomas must always be excised and the artery repaired.

An arteriovenous fistula is an abnormal communication between an artery and a vein. It may take place between two large vessels such as the renal and femoral vessels or between much smaller units. The characteristic clinical sign of arteriovenous fistula is

the "thrill" or vibration which can be felt on palpation. The communication may be large or small, single or multiple. The simple fistula is nearly always the result of an accident, is frequently found in the upper thigh. Such cases can be very serious and often affect the heart. The arteries and veins affected by the arteriovenous fistula become varicosed.

The multiple fistula is of congenital origin and is accompanied by congenital lesions of other vessels, venules and capillaries, called angioma. The gravity of the condition is determined by the number, the age, and the size of the arteriovenous fistulae. Surgery may not offer a permanent solution, for even if some improvement is effected by removal of all known fistulae, new ones are likely to appear.

In certain cases, angiomas occur separately affecting all soft tissues as well as the skin. This is called Klippel-Trenaunay disease.

Of all the known circulatory diseases, the most interesting are those in which vasomotor disorders, (vasodilatation and, more commonly vasoconstriction) are dominant. Some persons blush at the slightest provocation. This phenomenon is typical of spontaneous vasodilatation of small vessels. Some report that a segment of a digital vein will swell for no apparent reason accompanied by a sensation of burning. This is an instance of acute vasodilatation. There is also a condition known as erythromelalgia, the name given to reddening and burning pain in the feet, occurring during simple dependency of the extremity.

Nevertheless, many more people suffer from chilly feet, cold, cyanosed hands. This is due to vasoconstriction of the arterioles. The condition is called acrocyanosis and is often associated with excessive sweating.

Some patients feel pain in the calf while walking, but palpation of the arteries in the foot will reveal a normal pulse. If examined a short while later, however, the pulsation surprisingly has disappeared. I was personally quite puzzled by this phenomenon and tried to find out what results could be obtained from lumbar sympathectomy. In 1958, I devised a way of photographing arteriographs in sequence (four exposures at five second intervals) using an automatic device to inject the contrast medium under even pressure. My clinical observations were confirmed. In certain persons, with otherwise healthy arteries, there is a special tendency for the arteries to constrict which is called arterial hypertonia.

Raynaud's disease affects the smaller arteries of the digits. It is a spastic disease usually found in young women between 20 and 30 years old. It affects the hands in particular, attacking first one phalange of both hands, then beginning with the index or middle finger, the fingers are affected in turn, the thumb last of all. By the time the thumb is involved, the vasomotor phenomenon has spread to the terminal phalanges and may even encompass the whole hand.

Upon exposure to temperature changes, and occasionally without one being involved, the finger suddenly blanches, reduces its volume, becomes numb and insensitive. Instinctively, the patient will rub her hands or dip them in warm water; the finger turns deep purple, then red and begins to ache, tingle, burn and throb.

When this crisis of acroasphyxia takes place in an older person, it usually affects only one or two fingers of one hand. Undoubtedly, cold may induce this state, but its real cause could be traumatic: an arterial lesion, either local or remote; for example, cervical rib which involves compression of the brachial plexus or the subclavian artery. We call such occurrences Raynaud's phenomenon.

This phenomenon is treated by sympathectomy and repair of the shoulder girdle which involves the scalenus muscle, abnormal cervical or first rib.

Raynaud's disease in young women can nearly always be helped by ordinary protective health measures against cold. Sympathectomy is indicated only if the trouble persists and threatens to cause sclerodactyly. This does not exclude the use of a new drug, epsilonaminocaproic acid, especially if the sclerodactyly tends to progress.

Traumatic Lesions: This includes partial or complete section of an artery by a sharp or blunt object such as a bullet, a knife, glass or metal splinter, animal's horn or teeth causing hemor-

rhage, pulsating hematoma or an arteriovenous fistula.

Immediate complications are bruising, stretching of an artery in a crushed limb or in a fractured or disjointed knee or elbow. This sometimes results in rupture without hemorrhage due to spasm of the artery at both ends. French surgeons of the first World War called this "local stupor." At other times there is spasm which may be temporary, prolonged or permanent, followed by various disorders such as the contraction of certain muscles through ischemia (Volkmann's contracture), and even gangrene. Deep or superficial phlebitis may pass unnoticed, masked by other damage to the flesh.

Later complications include vasomotor troubles resulting from simple vasoconstriction, Raynaud's phenomenon, seen after severe frost bite, trauma to a finger or handling a pneumatic drill in cold and damp weather; or by alternating vasodilatation and vasoconstriction, Sudeck's disease.

In trauma of the lower limbs, we must be on the lookout for possible pulmonary embolism, recognizable by a sudden pain in the side or breathlessness. Fatty embolism is also a sudden and unpredictable killer. Pulmonary embolism, unfortunately, does not give any warning.

CONCLUSION

If this discussion has been instrumental in helping the good nurse to understand the causes and mechanisms of the phenomena seen in patients with circulatory disorders, our aim has been achieved.

If, in addition, the attentive, inquiring nurse can find in the signs and symptoms described, assistance in providing more accurate information to the surgeon or of warning him in good time, we will have been amply rewarded.

The qualities desired in the nurse who is interested in vascular diseases and who wishes to devote herself to that field are most exacting. Observation of the patients before and after operations is most demanding and must be constant. In the operating room she becomes the surgeon's collaborator, not a mere servant. This involves great demands on her personally. She should become familiar with various operating techniques dealing with the muscles and skin, as well as surgery of the sympathetic nerves and blood vessels. She should be ready to revert easily from skin grafting in an ulcer case to arterial grafting in thrombosis. She must understand every move the surgeon makes and each phase of the operation. If necessary, she must be able to handle a retractor in a dangerous position, cut sutures; and tie knots. Her response to orders must be swift, her attitude flexible in the face of contradictions which inevitably crop up under unpredictable circumstances. She needs strong nerves, a quick mind, and the patience of an angel!

MORE FROM GADFLY

Etymology (words, not insects) always adds interest to life. Musing on the derivation of the word "clinical" (which, as keen readers of this column know comes from the Greek word for a bed) it occurred to me that a free translation of the phrase "pre-clinical teaching" might well be "bedtime stories." There may be other readers who will conjure up a vision of the Great Bed of Ware when people talk about "wide clinical experience." — Jottings by Gadfly. *Nursing Times*, 59:1335, Oct. 18, 1963.

Why a Woman Buys Things

1. It makes her look thin.
2. It came from Paris.
3. Her husband says she can't have it.
4. Her neighbors can't afford it.
5. Nobody has one.
6. Everybody has one.
7. It is different.
8. BECAUSE!

* * *

It is still not too late to make that very important New Year's resolution: "Resolved, that I will stop smoking *today*."

Clinical Investigation in Peripheral Vascular Disease

J. Y. McGraw, M.D., D.SC., PH.D.

A review of methods used in the diagnosis of peripheral vascular diseases.

The unfortunate use of the term peripheral vascular disease has led to much confusion in the diagnosis and discussion of diseases of the peripheral arteries, veins, and other blood and lymph vessels. Most physicians consider that the term applies only to the upper and lower extremities; others restrict it to *arterial* diseases of the extremities. In its broadest sense, however, peripheral vascular disease applies to disease of any of the blood vessels utside of the heart, and includes diseases of the lymphatics as well.

These conditions do not constitute a hodgepodge, but are a clearly delineated and reasonably well-understood group of individually distinct diseases. The symptoms of each are as characteristic as those of most diseases and, generally speaking, a particular symptom is definitely pathognomonic of a specific disease.

Vascular Examination

The diagnosis of diseases affecting the peripheral vessels is facilitated by the fact that the extremities, which are usually involved, lend themselves exceptionally well to physical examination. The effects of diseases in these vessels are manifested with extraordinary clarity by changes that are usually detected by the experienced observer through judicious use of his eyes and hands. Circulation is modified by many factors:

Ingestion of food and alcohol; smoking; exercise; emotion; perspiration; position of the limbs; environmental temperature.

There are basal conditions for study of the circulation, just as there are basal conditions for study of metabolism. Accordingly, a patient whose circulation is to be studied under basal conditions should not have had food or alcohol for eight hours; should not smoke for two hours; should be in a room in which the temperature is maintained between 21° and 24°C. (70° to 75°F.).

Since changes in environmental temperature cause marked changes in peripheral circulation, studies of the effects of various factors and agents other than environmental temperature must be carried out in a room in which the temperature varies within narrow limits, usually about 1°C. (about 1.8°F.). Many studies on circulation reported in medical literature are largely or entirely without value because the results have been modified greatly by an inconstant environmental temperature.

Lack of knowledge about the procedures that constitute an adequate physical examination for diseases of peripheral circulation handicaps many physicians. The ability to make an accurate diagnosis depends upon a rudimentary knowledge of the symptoms and signs associated with various disturbances, and the knowledge and ability to carry out adequate examination. The first step is to elicit a careful, complete history of the patient's complaints, and find out whether or not these are referrable to peripheral circulation. If the complaints obviously have not originated from this source, physical examination can quickly and easily confirm the fact. If the complaints definitely indicate impaired circulation, or its possibility or probability, more detailed examination is necessary.

The examination of the extremities

Dr. McGraw is with the Department of Cardiovascular Surgery, Hôtel-Dieu Hospital, Montreal.

of such patients is ordinarily simple and quick. The three chief steps are: inspection, palpation, and auscultation. If the findings are negative, peripheral vascular disease, except perhaps Raynaud's and erythromelalgia, may be excluded. If, on the other hand, findings are positive at any point, more detailed examination and analysis are advisable.

Special Methods

Oscillometry is a simple but very useful adjunct to general physical examination. The oscillometer is an instrument for pulse detection and for its measurement at various occluding pressures. The oscillometric index represents the maximal excursion of a needle, expressed in units. Since the oscillometer is capable of exploring an artery through several levels, it can be very helpful in determining the approximate site of an occlusion. The oscillometer is also useful for following the course of arterial disease and the long-term effects of therapy.

One of the most commonly used indirect methods of studying the status of the circulation of the extremities is determination of skin temperature. The temperature of the skin surface depends upon: environmental temperature, the temperature of the blood flowing through the skin, and the amount of it per unit of time. Generally speaking, the rate of blood flow in the digits of patients with severe obliterative disease of the arteries is reduced and the temperature of the skin reflects it very accurately. For clinical purposes, simple determinations of skin temperature with an appropriate instrument, such as an electronic thermometer, are quite adequate in estimating blood flow. For studies of the circulation in the presence of high rates of flow, plethysmography and isotope techniques yield much more accurate data than measurements of skin temperature.

The plethysmograph has been a valuable instrument in the study of peripheral circulation, beginning with its early use for this purpose by Poiseuile in 1828. By enclosing a limb, a portion of a limb, a toe or finger within it and attaching the instrument by means of pressure tubing to an amplifying and recording device, records can be made and analyzed of the changes in blood volume of the enclosed part. These changes occur in the pulse; in acute obstruction of venous drainage of the part; in alterations in general hemodynamics. The rate of increase in blood volume of the enclosed portion is measured by the deviation of the recorder and by a timing device. The increase of volume per unit of time is assumed to be an indication of actual blood flow to the particular area involved. The value of the data and the ease with which such information is obtained make whole limb, segmental, or digital plethysmography a very useful procedure for preoperative evaluation and monitoring; for estimation of the competence of collateral circulation; for determination of the effect on a sympathetic block; for postoperative studies.

Isotopes have been used extensively for investigation of peripheral circulation. While informative and accurate, too little is gained over other simpler techniques to warrant the use of this more complex technique in preference.

A number of flowmeters have been devised for measuring the rate of blood flow through an artery or vein. The principles employed have varied from that of heat exchange to electromagnetism. These instruments have been used in experimental work. They have not yet been perfected and are not readily applicable to the preoperative and postoperative study of patients with peripheral vascular disease.

In studying disturbances of the peripheral circulation it must be remembered that the chief function of the arteries is the transportation of blood and this function is entirely dependent on the size of the lumen and the presence or absence of obstruction. To use any of the reconstructive techniques of vascular surgery, the surgeon must have precise information regarding the location of the obstruction; the patency of the main channel and of at least some of its branches beyond the obstruction; the character of the arterial wall above and below the obstruction. Angiography has made this type of essential information available. Without it, recent advances

in surgery related to peripheral circulation would not have been possible.

There are many possibilities for the study of the pathology, normal and pathologic physiology of the veins of the extremities by direct venography. Injections may be made at many different points; the patient may be placed in different postures. Rates of blood flow may be studied with the fluoroscope; stereoscopic plates may be taken. The effects of venous compression at various points may be noted; the effects of treatment may be followed. Consequently, the technique of venography varies according to whether or not anatomic data only are desired or if, in addition, information concerning the direction and rapidity of blood flow is needed. Venography may be used to visualize incompetent valves; venous thrombosis; venospasms; back flow of blood into tributary veins; marked narrowing of all superficial veins as a result of intense swelling of the extremity, such as in lymphedema. Venography may also be judiciously advocated in definitive diagnosis of acute venous thrombosis of the veins of the lower extremities. Lymphography is indicated in some cases of idiopathic peripheral edema, and may prove to be a useful adjunct in studies on neoplastic involvement of lymp channels and lymph nodes.

Capillary strength may be studied and quantitatively measured by a number of methods that are basically positive or negative pressure techniques, the latter being actually the only satisfactory ones. The majority of healthy adult subjects to whom the negative pressure test is applied give relatively constant values under the same physiological conditions. A number of vascular diseases or blood dyscrasias, and various systemic diseases involving blood-vascular components, record definitely abnormal values indicating decreased capillary resistance or increased capillary fragility in suspected or proven illness.

Determinations of venous pressures and circulation time may be very useful in some conditions where cardiac hemodynamics are involved, and in some cases of arteriovenous fistulas.

Evaluation

A practical evaluation of peripheral circulation can be performed very quickly and should be an integral part of the physical examination of every patient. It consists of palpation of the pulses and observation of the character of the walls of palpable vessels. Auscultation provides information when sounds are made by the flow of blood through various arteries. The oscillometric reading is of value in comparing the two extremities of the same individual and in determining the point of arterial occlusion in an artery.

Physiological studies of the peripheral circulation and special methods of investigation of human circulatory physiology and pathology, are carried out for research purposes and to determine to what extent, if at all, circulation can be improved by ablation or paralysis of sympathetic control, or by reconstructive surgical procedures. After therapy, the course of the vascular disease and the success or failure of operative and other procedures can be recorded by means of periodic tests of the circulation in the involved extremities. As a by-product, such measurements have provided a mass of data which have helped to clarify some problems in relation to anatomy and physiology of the circulatory system in man.

General evaluation of a patient with peripheral vascular disease extends beyond delineation of the local problem. An individual who has a symptom-producing vascular lesion in one area is often found to have significant but asymptomatic lesions in other locations, sometimes of more importance than the initial trouble. This is particularly true in the patient with arteriosclerosis. A significant proportion of patients with arteriosclerosis of the abdominal aorta, iliac and femoral arteries, which produces symptoms and signs of ischemia will, on complete evaluation, show renovascular, coronary or cerebro-vascular disease. The most frequent serious complication of arterial surgery arises from acute arterial occlusion in another area. The arteriosclerotic patient, therefore, must be examined in relation to his renal

function, and with particular attention if he is hypertensive. Similarly, the coronary circulation is evaluated, and careful attention is given to eliciting any history of symptoms that might be attributed to intermittent cerebral ischemia.

Conclusion

That such an article as this can be written is owing, in no small part, to research in the pathology, physiology and biochemistry of the peripheral circulation. Our own contributions in this field indicate our sympathy with, and regard for investigations that contribute to knowledge in this area. We recognize that a method of study may have merit without having practical clinical usefulness; that research is an end in itself and needs no defence, although there may be a wide spread between knowledge and useful knowledge. For the non-specialist, from a diagnosic standpoint, a firm foundation of knowledge of symptoms of disturbances in peripheral circulation and the ability to carry out examination accurately suffices. More precise techniques and more specialized methods of investigation are essential for purposes of research or for treatment and care in a specialized centre, but provide little, if any, additional information that can be decisive in the diagnosis, immediate management and proper referral of a particular patient with peripheral vascular disease.

HEART DISEASE IN ADULTS

Léon L. Lebel, M.D.

New diagnostic methods have accounted for increasing success in the treatment of certain adult heart diseases.

After a number of years' experience in adult cardiology we have come to realize that, by and large, there are two main categories of disease: rheumatic valvular impairment, particularly mitral and aortic; arteriosclerosis of the coronary arteries resulting in coronary insufficiency. The latter gives rise to angina pectoris, on one hand and coronary thrombosis with secondary infarction on the other.

Twenty years ago, treatment of these two types of disease was inadequate even though diagnosis was relatively simple. Today, they can be assessed more easily owing to modern diagnostic methods, such as clinical techniques, phonocardiography, electrocardiography, radiography, vectorcardiography, catheterization, cardioangiography.

The future of these patients is much brighter as a result of standardization of treatment in relation to living conditions, diet, more effective medication, open or closed heart surgery. Excellent results are obtained in a high percentage of cases, thus improving prognosis generally to an extraordinary degree.

Formerly, the majority of these patients became invalids within a relavival is prolonged by several decades tively short period. Today, their surand they can lead a nearly normal life. This is a great advantage to the individual, to the family and to society.

Dr. Lebel is chief of the Cardiology Section, Department of Medicine, Hôtel Dieu, Montreal.

Acquired Valvular Lesions

Mitral and aortic lesions comprise 90-95 per cent of the valvular conditions found in adults. Pulmonary and tricuspid lesions may arise, but they rarely occur alone and are very few in number. It should be pointed out that valvular lesions are usually secondary to an attack of rheumatic fever.

A. *Mitral Valvular Disease*

Diseases of the mitral valve result in mitral stenosis or mitral insufficiency or a combination of the two. At the outset these lesions are well compensated and show no symptoms, although they can be diagnosed by auscultation and confirmed by various examinations which indicate:

1. The type of valvular affection, such as stenosis, insufficiency, or both;
2. the degree of stenosis or insufficiency;
3. which flap of the valve is most affected and the presence of calcification in the ring or valves.

1. Mitral stenosis is characterized by a diastolic murmur, an accentuated first sound (M1+), the presence of a mitral third sound (M3), with an accentuated and sometimes reduplicated pulmonary second sound (P2+).

As this disease develops the following symptoms, signs and complications appear:

asthenia, exertional dyspnea, decubitus dyspnea, palpitation, hemoptysis, acute pulmonary edema, total arrhythmia, embolism of the greater circulation, terminal insufficiency of the right ventricle with hepatomegaly, ascites, edema and sometimes bacterial endocarditis.

Death finally ensues after lengthy invalidism.

Electrocardiography, radiography, cardio-angiography and catheterization will show hypertrophy of the left auricle and of the right ventricle, with pulmonary arterial and capillary hypertension.

2. Mitral insufficiency is characterized by a loud holosystolic murmur at the apex with transmission to the back; a slightly augmented pulmonary second sound; hypertrophy of the left auricle and of the left ventricle; moderate pulmonary hypertension..

The principal symptoms, signs and complications are:

exertional and decubitus dyspnea, palpitation, pulmonary edema secondary to insufficiency of the left ventricle and pulmonary hypertension; auricular fibrillation; less frequently, embolism into the general circulation; acute or subacute bacterial endocarditis; terminal cardiac insufficiency.

3. Mitral disease is a combination of stenosis and insufficiency, with one or the other predominating, and displaying the appropriate signs and symptoms.

Medical Treatment

This was the time-honored method of dealing with such lesions until 20 years ago when it was rightly replaced by surgical treatment. Medical treatment consists mainly in the treatment of symptoms and signs of insufficiency, fibrillation and embolism.

1. A fairly low caloric, low sodium diet in order to limit weight and prevent edema;
2. Digitalis and its derivatives to slow down the heart rate and improve heart tone;
3. Diuretics to increase urinary output and decrease edema;
4. Anticoagulants to prevent or control embolism;
5. Restricted physical exertion.

Surgical Treatment

Mitral commissurotomy involves opening the mitral orifice and removing the clots present in the left atrium. In cases of combined mitral insufficiency and stenosis the surgeon corrects the stenosis by commissurotomy and reduces the size of the enlarged annulus. This usually requires open heart operation. Mitral surgery seems to be developing towards total replacement of the mitral valve.

B. *Aortic Lesions*

Aortic stenosis gives no real trouble until it reaches 70 -75 per cent closure. When the stricture is sufficiently developed the chief symptoms are:

Syncope upon exertion and subsequently at rest; angina pectoris; acute pulmonary edema and cardiac insufficiency;

Sudden death is common in patients with this lesion;

Signs

Harsh aortic systolic murmur; disappearance of the aortic second sound; systolic thrill at the second intercostal space; arterial hypertension; thrill and systolic murmur transmitted to the cervical blood vessels.

Valvular calcification can be visualized by fluoroscopy or radiography, cineradioscopy or cineradiography.

Electrocardiography and radiology indicate the presence of left ventricular hypertrophy. Catheterization and cardio-angiography give precise data on the type and degree of stenosis.

Prognosis

As long as patients remain asymptomatic, the disease gives no trouble, but when symptoms begin to appear a fatal end is the general rule, within a few months or a few years.

Medical Treatment

The medical treatment is not very satisfactory. Its chief features are:

1. Prevention of infections; restriction of vigorous physical exertion; reduction of weight;
2. Relief of cardiac insufficiency.

Surgical Treatment

This is the only efficient form of treatment, when it can be carried out successfully. It consists of 1. a valvotomy — enlarging the valvular opening through the ventricle, or preferably through the aorta using the open heart method with extracorporeal circulation or
2. replacement of the entire aortic valve by a prosthesis.

The latter procedure is still in the experimental stage in nearly all centres. The results so far have not been particularly spectacular. Patients who were operated upon with apparent success have not as yet survived long enough to prove the efficiency of the many types of artificial valves now in use. Nevertheless, valvular replacement should be attempted, otherwise these patients usually die under 40 years of age despite all medical treatment.

Aortic insufficiency may be described as failure of the aortic valves to close properly at each diastole. It may be tolerated for some time without any symptoms. As soon as symptoms appear, the condition may progress very rapidly.

The first indications are exertional dyspnea and palpitation. Later, paroxysmal nocturnal dyspnea is experienced; irreversible heart failure occurs. Many of these patients have attacks of syncope, angina and myocardial infarction.

Signs

Diastolic murmur at the aortic orifice and along the sternal border, often accompanied by a low systolic murmur in the second right intercostal space; capillary pulse; water hammer pulse. The diastolic reading is low which gives a high differential between the systolic and diastolic levels. Electrocardiogram, radiography and fluoroscopy show hypertrophy of the left ventricle, while catheterization and cine-angiography indicate insufficiency very clearly, and sometimes even the degree of insufficiency.

Treatment

Medical and surgical treatment are similar to that for aortic stenosis. In aortic insufficiency, surgical treatment so far has been confined to replacement of the aortic valve.

Coronary Diseases (Ischemic Heart Diseases)

Coronary disease appears in two forms: angina pectoris, and myocardial infarction usually secondary to thrombosis of one or more coronary arteries.

Angina pectoris is a disease in which the blood supply brought to the heart by the coronary arteries is insufficient, resulting in a lack of oxygen or anoxia of the myocardium. The disease is chiefly characterized by pain described as constriction, heaviness, burning or boring. The location of the pain can vary widely; retrosternal or midthoracic, in the left precordial region or epigastric region. The pain may radiate to one or both arms, to the neck and jaw and to the back. Clinical examination usually shows little out of the ordinary, although more intensive investigation may reveal certain anomalies.

The electrocardiogram is the best diagnostic measure, but even this will show no abnormality in many cases. In others, ischemia of the myocardium will be detected. Electrocardiogram during exertion may detect coronary insufficiency which is not present at rest. This latter technique should be used cautiously since results are often

difficult to interpret and it may present some danger to the patient.

Angina pectoris often leads to coronary thrombosis, infarction and even sudden death.

Acute myocardial infarction, also called coronary occlusion, or coronary thrombosis, is characterized by acute ischemia of the myocardium lasting long enough to cause a marked oxygen deficit in the myocardial fibres which degenerate or necrose, producing infarction of the region fed by the artery involved.

The mains symptoms are:
Precordial pain or other indications similar to the anginal syndrome. The pain is usually more acute and prolonged; is felt over a larger region and transmitted further. There is profuse perspiration, pallor, coldness, weakness, loss of consciousness vomiting.

The main signs are:
tachycardia, dyspnea, arrhythmia drop in blood pressure or shock, feeble heart sounds, gallop rhythm fever, pulmonary congestion, acute pulmonary edema and, occasionally, pericardial friction.

The ECG shows the changes characteristic of myocardial infarction including arrhythmia. The white cell count, transaminase level and sedimentation rate are high. Radiography shows pulmonary congestion, cardiomegaly and pericardial effusion.

Complications include irreversible shock, acute pulmonary edema. ventricular fibrillation and heart failure leading to death.

Treatment

Measures used are the same as for angina and thrombosis without complications:

1. Rest, limitation of exertion;
2. Diet without animal fat and low in salt. This seems to be the generally accepted method of preventing arteriosclerosis and reducing weight if the patient is obese.
3. The use of tobacco should be discontinued, as a preventive measure, if this is acceptable to the patient, or if it causes pain, arrhythmia and tachycardia.
4. Anticoagulant therapy is in general use today, but may sometimes cause serious complications in the form of multiple hemorrhages. However, the benefits generally offset the inconveniences. Vasodilators of all kinds especially nitroglycerin, digitalis, quinidine, Pronestyl and diuretics are prescribed as required.

Pressor substances are administered chiefly for shock or prolonged hypotension. Opiates or synthetic derivatives are given to ease pain. Barbiturates or tranquilizers alleviate the anxiety present in some patients.

Surgical Treatment

For many years surgeons have tried different operations more or less successfully. The chief ones are: stellectomy; cervicodorsal sympathectomy; denervation of the thoracic aortic plexus and ligation of the great cardiac vein; ligation of the internal mammary arteries; sprinkling the pericardium with asbestos powder; grafting the internal mammary artery at the apex of the heart; anastomosis; peritoneal grafting; resection of atheromatous spots in the coronary arteries. All have had their heyday, but none as yet has proved to be specific and ideal.

Conclusion

I would like to emphasize the excellent work performed by our nurses in the care of cardiac patients. The nurse contributes directly to their psychic health by her constant encouragement and her attentive care helps them both emotionally and physically. Along with the physician, she contributes directly to the reputation of medicine in general and, of this unit in particular.

For those nurses who are especially interested in cardiovascular nursing, two books are recommended: "*Qu'attendez-vous du médecin?* by Gabriel Marcel and associates, which is equally suitable for nurses and doctors, and *Heart Attack* by Myron Prinzmetal, M.D. and William Winter, patient.

Live always in the best company when you read. — SIDNEY SMITH

CARDIAC CATHETERIZATION

J. DE L. MIGNAULT

In 1929, Forssman made himself famous by introducing catheters into his own veins, as far as his heart. He meant to demonstrate that it could be done without precipitating intravascular thrombosis. It did not even occur to him that such an experiment would lead others into the development of a practical laboratory procedure useful for the diagnosis of heart diseases. In 1941, Cournand and Dexter used catheters to obtain physiological data concerning the cardiovascular system. Thus cardiac catheterization was initiated.

Many new developments followed the first few experiments. At first, determination of the oxygen saturation of the blood required time-consuming and complicated chemical analyses. The application of modern physics resulted in the development of oximeters which determine blood oxygen saturation within a few seconds. The water column first used to measure pressures within the cardiac chambers has been replaced by electronic manometers. Not only do they provide an easier means of measurement but they also register the pressure. The morphology of the curves can be studied and provides additional information. In the beginning, the intracardiac catheter could be visualized with difficulty by the use of a fluoroscope in a darkened room. Now, with image intensifiers, the image of the heart can be projected on a television screen and the operator can work in the light.

Steinberg was the first to use an injection of a radiopaque substance to permit radiography of the heart chambers. This procedure, which was called angiocardiography, not only gave additional information but also was the first step in the development of selective angiocardiography and cine-angiocardiography, as they are practised today.

These new procedures have facilitated the diagnosis of heart disease but, at the same time, they have required the organization of special laboratories — the appearance of which is enough to frighten even nurses (Fig. 1). Since the latter live in close contact with the patients, they are the ones who will be asked about procedures. If the nurses themselves are frightened by techniques, they may communicate their fear to the patient instead of reassuring him. Since these tests are becoming increasingly common, it is important that nurses know about them.

Heart catheterization is really a painless procedure. A vein is isolated at the bend of the elbow or in the thigh. The only pain up to this point is the slight needle prick required for the local anesthesia. A catheter is introduced into the lumen of the vessel and slid gently up into the superior vena cava and the heart. Since the vessel walls have no pain fibres, this manipulation is entirely painless. Traction on vessels may cause a feeling of uneasiness, but in order to prevent it, the catheter is pushed in slowly under fluoroscopic control and any undue pressure is avoided if the tip of the catheter happens to pass into a small collateral vessel instead of following the main one.

As a result of this procedure, three types of information can be obtained.

If the catheter passes through an abnormal communication, this is direct proof of such a defect. If the catheter tip goes from the right atrium into the left atrium and thence into a pulmon-

Dr. Mignault is a cardiologist attached to the Hemodynamics Laboratory, Hôtel-Dieu Hospital, Montreal.

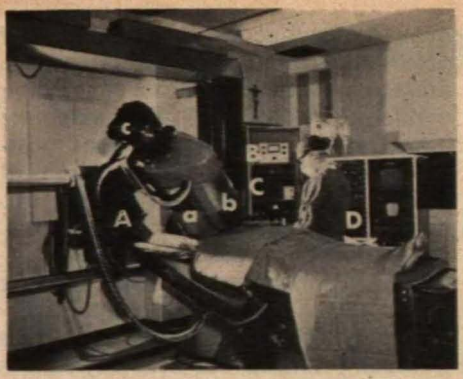


Fig. 1 Catheterization room. A. "Saturn" unit developed by Drs. Jutras, Roy, radiologists, and J. de L. Mignault, cardiologist. a. Image intensifier. b. Television camera. c. Cinecamera. B. Densitometer for dye dilution curve studies. C. Oximeters. D. Recording system.

ary vein (Fig. 2), there must be an interatrial septal defect.

By way of the catheter, blood samples can be taken from different areas of the circulation. The venous blood has exchanged its oxygen for CO_2, therefore it is unsaturated. Since CO_2

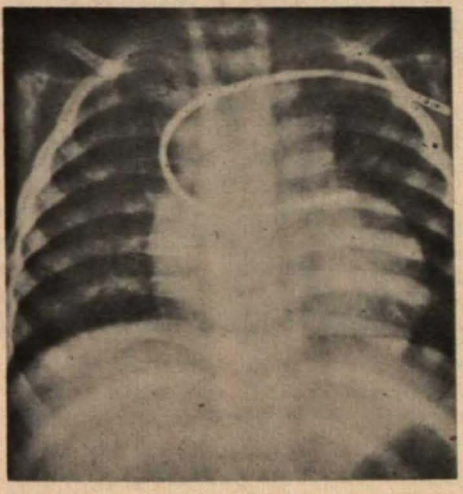


Fig. 2 Atrial septal defect. The catheter passes from the right atrium into the left atrium.

is eliminated and oxygen absorbed at the level of the pulmonary capillaries, blood withdrawn from the venae cavae, the right atrium, the right ventricle of the pulmonary artery will show the same oxygen content. If blood oxygen saturation suddenly becomes greater in one chamber than in the cavity behind it, it means that the venous blood has been contaminated with arterial blood coming from the left side of the heart. If such contamination is noted in the atrial blood sample, one may conclude there is an interatrial septal defect.

The third type of information concerns pressure recording. Since the catheter has an opening at its distal end, the pressure at the tip of the catheter can be recorded. When a ventricle contracts, it forces the blood into the artery with which it communicates. The systolic pressure, which is the pressure

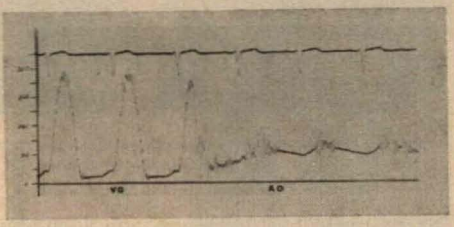


Fig. 3 Systolic pressure gradient between left ventricle and aorta, in aortic stenosis. VG — left ventricle. AO — aorta.

recorded during the ventricular contraction, is transmitted to the communicating artery. The systolic pressure in the ventricle and the artery should be the same. If there is valvular stenosis, the pressure will not be transmitted normally. Systolic pressure will be greater in the ventricle than in the artery above the valve. This difference in pressure can be readily demonstrated in aortic stenosis if the pressure is recorded constantly as the catheter moves from the ventricle into the aorta (Fig. 3).

Even with all of these data, diagnosis may still be uncertain. Angiocardiography must then be utilized. The radiopaque substance is injected by way of the catheter into a given cardiac chamber. The passage of the opaque material can be photographed on films with a serialograph, an apparatus which takes 6-8 exposures per second. One can also use a cinecamera to take as many as 60 exposures per second. When projected, the film discloses the movement of the radiopaque substance within the heart.

Still films provide better pictures photographically. Images are sharper and fine vascular structures can be visualized more clearly (Fig. 4). The movie camera adds movement and is

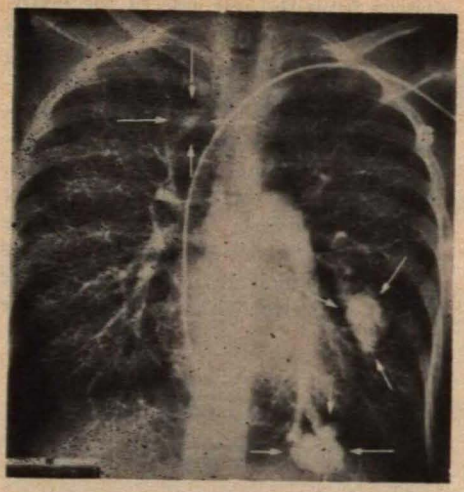


Fig. 4 Pulmonary arteriography Arrow points to the three pulmonary arteriovenous fistulae.

particularly helpful when one wishes to visualize the passage of blood from one cavity to another as in interventricular septal defect.

Other studies can be performed using the injection of dyes into the circulation. Some of these substances may give the skin a bluish tinge similar to cyanosis.

Nurses play an important role in the use of these new procedures. They must be able to recognize and report the complications likely to follow heart catheterization.

Arteries as well as veins may be catheterized. If hemostasis is inadequate, subcutaneous hemorrhage may occur. The presence of blood on the dressing; swelling at the site of incision; undue acceleration of the heart rate accompanied by a drop in blood pressure should alert the nurse to the possibility of hemorrhage. It is most important to observe the patient for six hours after the procedure.

The manipulation of the catheter within the vein may occasionally produce a localized thrombophlebitis. This is usually noticed the next day and is characterized by pain and redness in the area of the vein used. An occasional patient may have chills, tachycardia and mild hypotension. This simulates a post-transfusion reaction. The exact cause of this complication is unknown but it is probably due to pyrogens.

CONCLUSION

In summary, cardiac catheterization is a relatively simple, innocuous, painless procedure, in spite of the appearance of the catheterization room. The information gathered from exploration of the cardiac chambers; the recording of pressures; the determination of the oxygen content of the blood collected from different sites, helps to complete a clinical diagnosis and to determine the need for surgery.

Nurses must be aware of the nature of these tests in order to reassure the patient. Following the examination, blood pressure, pulse and the physical appearance of the site must be checked.

A daily one-gram dose of sulfadiazine is "just as good if not better" to prevent recurrences of rheumatic fever as a 200,000 unit dose of penicillen given twice daily. This finding was reported by a researcher at Irvington-on-Hudson, N. Y., where a long-term study has been comparing the relative effectiveness of different types of drugs for this purpose.

— *Heart Research Newsletter*

Heart disease is not something to be taken for granted, but something we should do something about. That is why the Heart Foundations of Canada were organized: to reduce death and disability in view of the occurrence of the disease in 1,400,000 Canadians, with 350,000 of them seriously disabled, and 72,000 dying in a year.

—*The Royal Bank of Canada Monthly Letter.*

ANGIOGRAPHY

PAUL ROY, M.D.

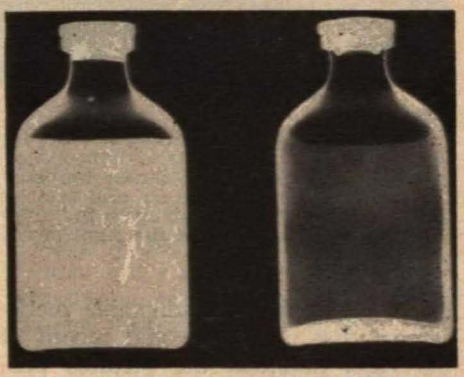
The role of radiology in cardiovascular conditions.

BASIC PRINCIPLES

Unless the walls are calcified owing to a very advanced stage of degeneration, blood vessels and cardiac cavities do not show up readily in radiography, and their capacity for absorbing x-rays is similar to that of the surrounding tissue. In other words, radiologically speaking, the density of the vascular structures is about the same as that of the muscles, fatty tissues and skin. To visualize the circulatory system, as we do the urinary and digestive tracts, it is necessary to resort to the artifice of "coloring," as it is commonly called. This term, however, is quite inexact as the processes of radiography in current use do not differentiate between colors. The films reveal only shades of black, grey and white.

The proper term should be opaque substance, opaque medium, opaque liquid, opacification agent or contrast agent or substance. We are, in fact, working with a liquid with a density approaching that of metals, whose great power of absorption does not allow X-rays to pass through it. Consequently, it acts as an opaque screen and projects a shadow onto the negatives which, when the film is developed, produces a comparatively brilliant white image, in contrast to the surrounding anatomic structures which appear as various shades of black or grey.

In exploration of the digestive tract, the opaque substance used is barium sulfate, an amorphous, innocuous powder. This agent should not be introduced into the blood stream, however, as it could cause serious and irreparable accidents such as thrombosis or embolism. To vizualize the circulatory system, an iodized substance is used (Fig. 1), composed of synthetic molecules carrying atoms of iodine. It comes in the form of a colorless, clear, water-soluble liquid, which mixes with the blood and is well tolerated. After travelling the entire cycle of the circulation, it is eliminated through the kidneys. It is nontoxic and nonallergenic. This same substance is commonly used for all endovenous urographic examinations.



A B

Figure 1

Demonstration of the opacity of a contrast medium

A. Iodized liquid. The density is the same as that of metallic cork.

B. Pure water.

The radiographic films are actually negatives with the shadows or opacities appearing in white on the dark background.

As soon as it enters the vessel, the opaque liquid is carried by the bloodstream and travels at the same speed, slower in the veins and very rapidly in the heart and arteries. To prevent too great a dilution in the blood, the iodized substance must be injected very quickly, for example 30 cc. per second into the aorta or arteries. This rate of injection cannot be achieved manually with an ordinary syringe. High quality pictures require automatic or semi-automatic injection.

The need immediately becomes apparent for radiographic equipment with

Dr. Roy is radiologist in charge of the cardiovascular division, Department of Radiology, Hôtel Dieu, Montreal.

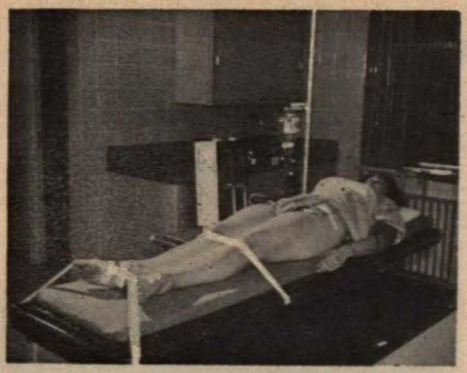


Figure 2

Patient placed on examination table for wide-field angiography (simultaneous bilateral arteriography of lower limbs). Needles in place in the femoral arteries and connected by "Y" tubing to the automatic injector situated at the right of the patient.

extremely rapid and adaptable mechanisms that can catch and record at the right moment, the pictures produced by the passage of the contrasting substance in the heart or blood vessels. A great many pictures must be taken to obtain a photographic reproduction of every phase of the cardiac cycle or of the circulation in a limb or internal organ. Such apparatus, though very expensive, is part of the battery of equipment found in many modern departments of radiology. Automatic, rapid seriographs can take two, six or even twelve pictures a second, while cinecameras adapted to radiographic processes have recording speeds varying from seven to 60 pictures a second. (In certain cases, they may even take more than 100 pictures a second).

In short, films record the picture of the blood in circulation. They show the outline of the vessels, or more precisely, their luminosity and their path, size and contours indicate the normal conditions or pathological modifications of the walls: dilatations, aneurysms, stenoses, obstructions and shunts.

The first objective of angiography is to detect or define cardiac or vascular lesions, congenital as well as acquired. Thus applied it has great value, but its usefulness extends much further afield. While studying the circulation of various organs, the radiologist can also detect and determine the nature of a large number of other diseases, not exactly vascular in origin but having a characteristic influence on the anatomic distribution of the vessels and sometimes inducing the emergence of arterial or venous networks which normally would not exist (neo-vascularization). Among these are tumors of the brain, tumors and cysts of the kidney, placental anomalies, certain bone lesions, arterial hypertension of renovascular origin, diseases of the lymph nodes (Hodgkin's, lymphoma) and many other pathological conditions.

Angiography can thus be defined as a "diagnostic procedure for the exploration of the vascular system by radiography with the use of a contrast medium." Angiocardiography is applied specifically to the study of the cardiac cavities. Aortography and arteriography apply particularly to visualization of the aorta and the arteries. When the arterial network of a particular internal organ is to be examined, we use the term "selective arteriography" of the brain, kidney, mesentery, celiac artery, etc. Venography and phlebography refer to visualization of the veins, while lymphadenography designates radiographic investigation of the lymphatic vessels and nodes.

INJECTION SITES IN ARTERIOGRAPHY

The major technical problem, and one that makes arteriography a highly specialized procedure, lies in the way the opaque medium is introduced into the vascular region under examination.

Cerebral arteriography (carotid)

The current method used in the majority of cases is direct injection of the contrast media into the carotid arteries through puncture on either side of the neck, under local or general anesthesia. The opaque substance is carried by the bloodstream and quickly outlines even the finest arterial ramifications of a large part of the brain.

Arteriography of the limbs

Visualization of the arterial system in the extremities, is obviously best achieved through puncture into the main artery at the origin of the arms or thighs (Fig. 2) and injection of the contrast substance under pressure.

Until lately, before undertaking a study of the vascular network of the limbs, surgeons always asked for wider and wider fields of vision which would nevertheless preserve the advantage of multiple pictures representing different phases of the circulatory cycle. The call for wide-field angiography was well justified, but none of the solutions offered seemed to meet the need. When arteries of the limb were clearly pictured, the aorto-iliac junction in the abdomen was completely out of the examination field. Conversely, when the aorta and the iliacs were visible, an important part of the extremities remained unseen. The radiologists at the Hôtel Dieu, pooled their experience and set to work on this challenging problem. In a few months they perfected a wide-field seriograph, completely automatic and synchronized with an automatic injector. The operator is fully protected against radiation by a remote control mechanism. With this equipment and with the aid of an accurate code to control puncture procedures, injection of the media and method of photography, simultaneous bilateral arteriographs (Fig. 3) of the limbs, for example, are now obtained as a matter of daily routine. The course of the opaque substance is recorded progressively on the films, from the iliac arteries down to the most remote ramifications in the feet.



Figure 3
Simultaneous bilateral arteriography of the lower limbs using wide-field angiography.
A. Over-all view.
B. Detailed view of a short segmental obliteration of the right popliteal artery. Collateral network established to assure good arterial circulation in the distal part of the limb.
C. Detailed view of the arterial opacification in the right foot. Note the excellent visualization of the connecting arteries and subcutaneous plantars.

Aortography and arteriography of the abdominal viscera

Since the advent of arterial catheterization, direct injection of the opaque substance is seldom used in translumbar and retrosternal aortography (Fig. 4) in order to visualize vessels of the trunk such as the arteries of the neck, thoracic aorta, abdominal aorta and visceral arteries. This direct method often requires general anesthesia and

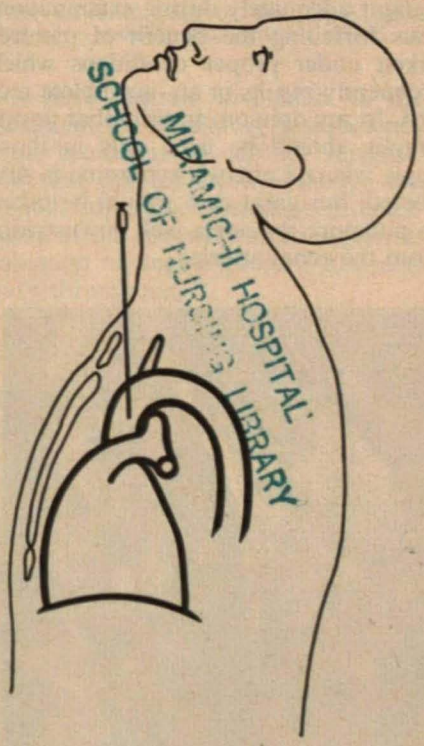

MIRAMICHI HOSPITAL
SCHOOL OF NURSING
LIBRARY

Figure 4
Retrosternal puncture of the aortic arch in thoracic aortography.



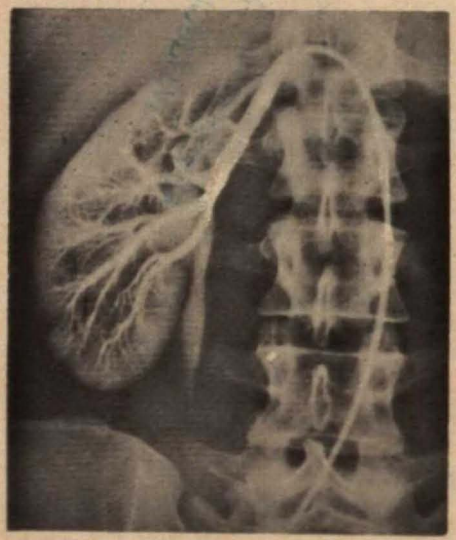
Figure 5
Catheterization of the axillary artery under local anesthetic.

presents grave danger of uncontrollable hematoma, intraparietal injections with dissection of the aortic walls, or massive and unwarranted injection into a visceral artery. Moreover, due to the inevitable risk of dislodging the needle from the point of puncture, it is impossible to alter the position of the patient adequately during examination, thus forfeiting the benefit of pictures taken under proper conditions which frequently results in an incomplete record. In my opinion, translumbar aortography should be used only in those cases where Leriche's syndrome is suspected, but great care should be taken to puncture the aorta well downstream from the renal arteries.

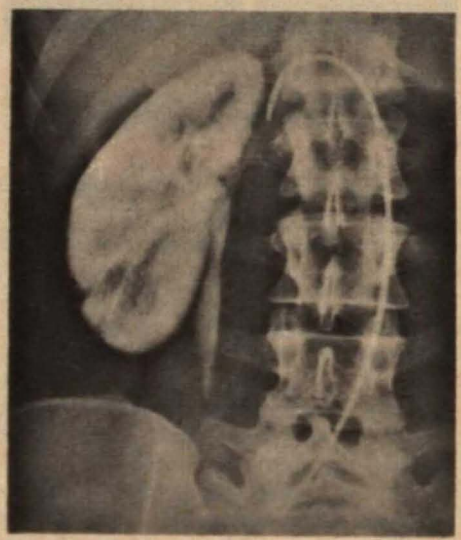
Aortography and abdominal and thoracic arteriography, as well as exploration of the arteries at the base of the neck are best served by arterial catheterization. A long, narrow tube of polyethylene, nylon or other synthetic substance is threaded into the artery of a given limb. The catheter is opaque to X-rays and is introduced upstream into the vessel under radioscopic control to the desired level in the aorta. The opaque substance is introduced into the tube and its progress photographed in rapid sequence. This technique obviates the inconveniences and dangers of direct aortography by needle puncture and permits opacification of specific regions with great precision.

These examinations have become much easier and less hazardous to perform since the introduction of the catheter no longer requires surgical exposure or incision of the vessel at the point of insertion.

A new form of catheterization, developed in Sweden 10 years ago by Seldinger, is as simple as it is clever. After local anesthesia is administered, the common femoral or brachial artery is punctured and, after a bit of manoeuvring, an opaque catheter is substituted for the needle, pushed upstream as far as the aorta and from there into one of its collateral branches (brachiocephalic, subclavian, celiac, renal, mesenteric), de-

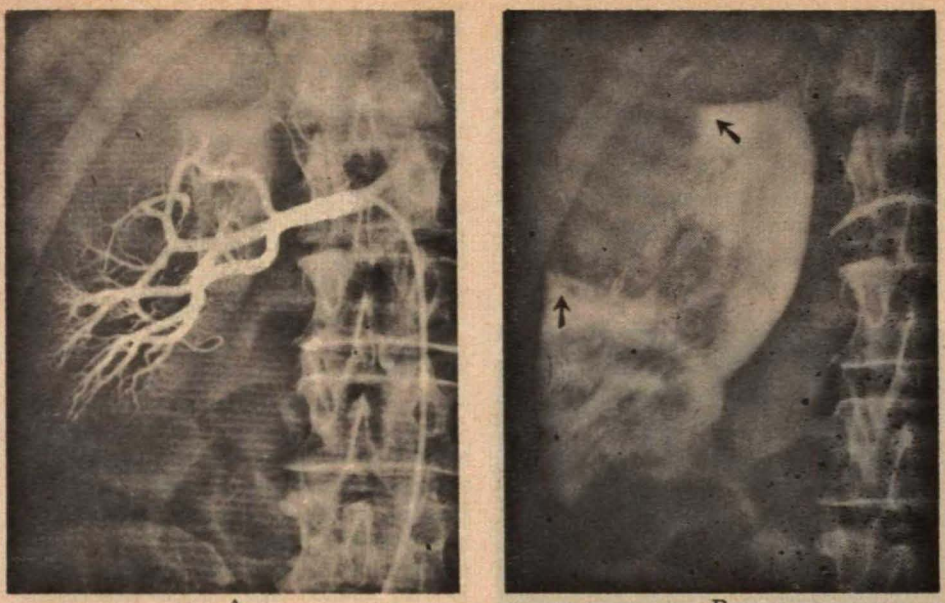


A



B

Figure 6
Normal selective right renal arteriography
A. Arterial opacification.
B. Stage of opacification in the renal tissue (nephrography).



A B

Figure 7
Selective right renal arteriography: renal cyst.
A. Arterial opacification.
B. Renographic stage: The dye goes up to the external part of the upper pole, revealing a large lacunar zone which is delimited by a spur of renal cortex raised up by the cyst.

pending on the exploration required.

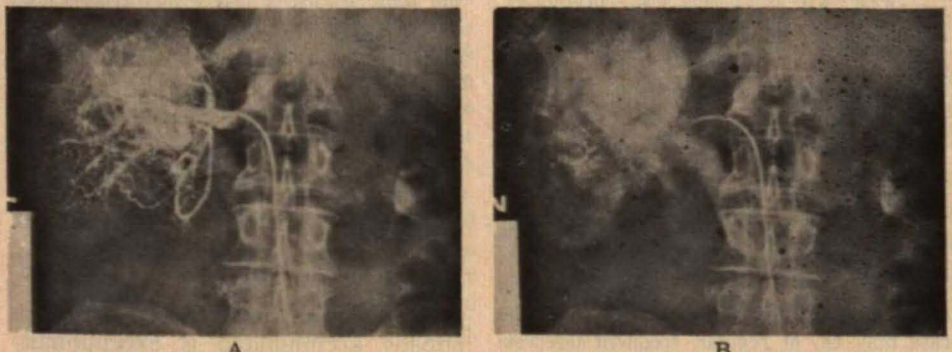
Catheterization of the brachial artery proved a little difficult, however, so we found another point of access, the axillary artery (Fig. 5). The aorta is easily reached from this spot, when entrance through the femoral artery is too difficult.

The pictures in Figures 6, 7 and 8 illustrate clearly the advantages of selective visceral arteriography of the abdomen. The results of opacification of the arteries at the base of the neck could be shown in the same way. Suffice it to say that these examinations have become invaluable in the assessment of circulatory insufficiency of the brain due to carotid, vertebral or basilar atheromatosis. Finally, and of equal importance, selective catheterization of the coronary arteries permits evaluation of angina pectoris and coronary thrombosis.

THE NURSE'S ROLE

The functions of the nurse in angiography, although limited, are, nevertheless, of prime importance.

The patient should be prepared for examination as thoroughly as for an operation.



A B

Figure 8
Selective right renal arteriography: kidney tumor (hypernephroma).
A. Arterial opacification: anarchic exuberance of the branches of the renal arteries.
B. Renographic stage: irregular opacification of the tumor tissue still showing the presence of several small arteries. The tumor is very vascular.

For all forms of abdominal angiography, complete bowel evacuation is required to ensure that the diagnostic pictures are not blurred or altered by the presence of spots cast by gas or feces. The pubic or axillary areas should be shaved, depending on the region used for the introduction of the catheter, to prevent contamination of needles or catheters, and, more particularly, to facilitate their manipulation.



Figure 9
Abdominal aortography by femoral catheterization.
Arterial hypertension caused by stricture (stenosis) at the origin of the right renal artery.

Adult patients of medium height and weight are usually given 20 cc. of sodium gardenal intramuscularly, about two hours before examination. To boost and prolong the effects of this premedication, an additional mixture of Demerol, 50 mg., Phenergan 50 mg., and atropine gr. 1/300 are given I.M. This mixture reduces the patient's anxiety and induces a carefree attitude and occasionally, drowsiness.

When the examination is over and the patient has been returned to his room, the nurse's role becomes most important. It can be summarized in two words: constant observation. All instructions by the angioradiologist should be observed to the last detail so as to note or prevent any complications. These are rare, however (2%), nearly always localized and easily controlled.

Thrombosis and arterial spasm can be detected by a periodic check on the strength of the peripheral pulse (radial, tibial posterior or in the foot), downstream from the spot used for insertion of the needle or catheter. Close observation and palpation of the axillary or inguinal region, as the case may be, at regular, frequent intervals (q. 15-30 minutes) will permit detection of the formation of hematomas. Finally, by noting the blood pressure and pulse rate q. 1/2 h., incipient shock can be detected; the patient's general condition evaluated, and his systemic reaction to angiography determined. It is not unusual for the patient to be rather tired after this examination, since it lasts an average of two and a half hours.

The nurse may relax her watch two to three hours after examination, for, by that time, the danger is usually past. Any exception to this rule should be indicated by the radiologist.

SUMMARY

In the course of the last decade, cardiac and vascular radiology — angioradiology — has developed at an astonishing rate. Medical reports and radiological conventions impress us constantly with the unlimited possibilities for the use of contrast media in study of the circulatory system. Although techniques and procedures are still in a developmental stage, the information already accumulated is exceptionally important, quantitatively as well as qualitatively.

Angiography was long considered applicable only to vascular and cardiac surgery.

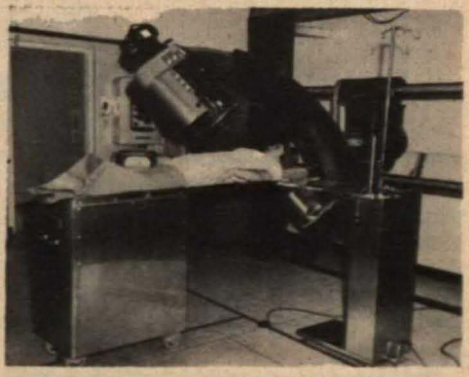


Figure 10
Vascular and cardiac catheterization unit. Televised radioscopy and radiocinematography can be carried out at any angle without having to modify the position of the patient during the examination. The x-ray tube is situated at one of the extremities of a large mobile support that is "C"-shaped. At the other extremity, the light amplifier, the video-camera and the cinecamera (35 mm.) are suspended. This complex can be moved in orbit or at all angles in the space surrounding the table. The table remains fixed at the chosen spot. The transparent surface of the table under the abdomen, chest and head, is free of any metallic support which could impede the passage of the rays. The movements of the apparatus are regulated by simple finger pressure on the control buttons, thus guaranteeing asepsis.

Today it is also of great benefit in study of lung conditions, neurological disorders, gastroenterology, orthopedics, internal medicine and, above all, in the broad field of arterial hypertension (Fig. 9).

Faith in this type of exploration has grown in conjunction with the sense of security obtained after repeated use of the new triiodized opaque substances. These are so innocuous that they can now be used routinely without any serious risk. After four years' experience and 3600 examinations, we have not observed one allergic or toxic reaction of any significance even after massive doses of Renografin 76% or Cardiografin 85%.

Angiographic procedures have undergone a complete change in the past five years, due to technical developments in radiological equipment. Vascular or cardiac catheterizations in the dim light of the conventional fluoroscopic screen have become part of the past and are even considered dangerous. The use, in a lighted room, of image intensifiers and televised closed-circuit radioscopy offer a much more accurate and wider view of the organs under examination. Elaborate positioning can now be accomplished under rigorous aseptic conditions.

Electromechanization of examining tables and all the main radiological accessories, remote control (Fig. 10), and continued improvement in protective measures against radiation, have contributed greatly to ease in performance of procedures.

Diagnostic data have been considerably enriched by the advent of radiocinematography, especially with regard to angiocardiography and coronary arteriography. More recently, a system of magnetic tape recording has improved the accuracy of readings significantly, as a result of almost instantaneous reproduction of radioscopic pictures. Results obtained at the most critical stage of examination can be analysed immediately and reassessed as desired.

Almost all areas of the human body are now open to vascular radiology related to veins, arteries or even lymph vessels.

Open Heart Surgery

PAUL H. STANLEY, M.D.

Heart surgery, as performed today, dates back to 1939 when Gross, a Boston surgeon who had long been interested in cardiac problems, performed the first successful ligature of an artery.

HISTORICAL BACKGROUND

Interest in cardiac problems dates back many years, but even though Souttar, of London, had succeeded in 1923 in correcting mitral stenosis by the technique that is still commonly used, the year 1939 marked the opening of the era of modern heart surgery. Advances have proceeded at an increasingly rapid rate. As early as 1945 Crafoord, a Swedish surgeon, took advantage of a mishap during an operation on an artery. The aorta ruptured and complete clamping of the thoracic aorta was required. He made good use of the principles arising from this accident and applied them in coarctation of the aorta by performing total resection of the constricted segment and end-to-end suturing.

In Baltimore, that same year, Blalock and Taussig developed a surgical technique to improve the condition of patients with extreme cyanosis due to inadequate pulmonary blood flow. Blalock's operation — an anastomosis between the subclavian and pulmonary arteries — results in an increased flow of blood to the lungs thereby improving blood oxygenation.

A few years later, in the United States and in England, Bailey and Brock simultaneously tackled the problem of mitral stenosis and succeeded in popularizing the feat achieved by Souttar some 25 years previously.

In 1951, Varco, in the United States, and Brock, in England, devoted their attention to another lesion — valvular pulmonary stenosis. They obtained encour-

Dr. Stanley is a cardiovascular surgeon on the staffs of Hôtel-Dieu and Ste Justine's Hospital, Montreal.

aging results from the introduction of a valvulotome through the right ventricle into the constricted valvular orifice in order to enlarge it.

All of these efforts, however, represented a blind approach to intracardiac lesions. Successful treatment of the more important and commoner congenital heart lesions was dependent upon the development of a technique whereby blood could bypass the heart and lungs, and thus permit open heart surgery. Numerous investigators had been interested in the problem for several years. At Stockholm, in 1948, Bjork, assistant to Crafoord, succeeded for the first time in keeping dogs alive whose blood had been bypassed from the heart and lungs through a mechanical oxygenator. Though purely experimental, this fundamental achievement opened new vistas in heart surgery.

Other investigators thought that the problem could be solved by finding a way to reduce the body's utilization of oxygen. Bigelow, in Toronto, conceived the idea of whole-body refrigeration, a technique whereby an animal was refrigerated by immersion in ice water. He demonstrated that basal metabolism was reduced proportionately to the lowering of the body temperature. An animal cooled to 30° C. could be deprived of circulation for 12 minutes without suffering any ischemic cerebral damage. Since the brain is the organ most sensitive to the absence of oxygen, it was concluded that circulatory arrest of this type would be well tolerated by the remainder of the organism.

The following year Lewis, at Minneapolis, applied the experimental principles established by Bigelow to humans and was able to correct interventricular septal defects in 75 patients.

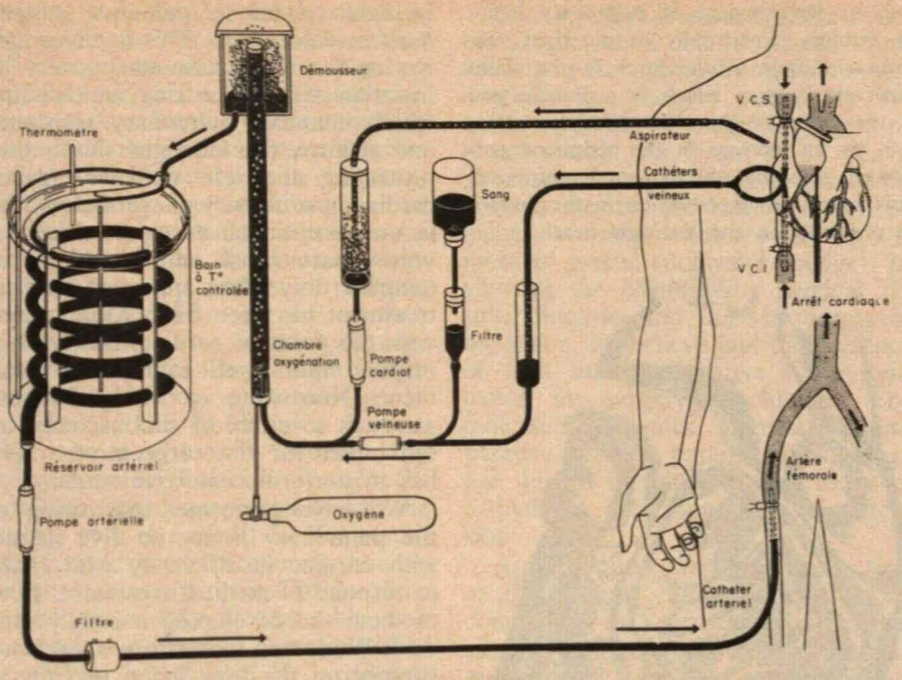
Though these hypothermal techniques were quite useful, their application was limited. The duration of circulatory arrest was too brief to permit repairing complicated cardiac lesions such as interventricular septal defects and Fallot's tetralogy. Furthermore, cold was found to increase the possibility of ventricular fibrillation, a frequently fatal complication in refrigerated patients. For these reasons, attempts were continued to develop an artificial heart-lung. In 1953, Gibbons of Philadelphia, after 10 years of research, successfully closed an interatrial communication with the help of a vertical-screen oxygenator.

The following year, 1954, Lillehei of Minneapolis devised a method of temporarily replacing the heart and lung of a patient by grafting the vascular system of a child to that of a donor parent. By means of the cross circulation thus established, Lillehei succeeded in the correction of lesions which had hitherto been considered inoperable: interventricular septal defects; Fallot's tetralogy; and a complicated lesion involving the entire atrioventricular channel.

This technique, however, raised moral objections in relation to exposing a healthy parent to the great risk involved in cross circulation in order to improve the condition of a sick child. Lillehei himself was the first to recognize the difficulties of this procedure. The following year his laboratory released the Dewall oxygenator in which oxygenation is achieved by bubbling oxygen through the venous blood. The problem of foaming produced by bubbling was solved by application of silicone to the walls of the reservoir, subsequently called the "defoaming chamber." Silicone has the property of freeing liquids from gas bubbles. The oxygenated blood, freed from air bubbles, is stored in a constant-temperature reservoir from which it is administered intra-arterially. This method of oxygenation has proved satisfactory. Lillehei has used it since 1955 with continued improvements. The apparatus has been in use at the Hôtel-Dieu and at Ste Justine's Hospital since 1958 when open heart surgery was initiated there.

In 1956, while research was being conducted at Minneapolis, Kirklin at the Mayo Clinic, worked on the Gibbons vertical-screen oxygenator, which he modified, improved and used on patients. Since then, he has performed open heart surgery for all types of congenital heart lesions.

Once the principles of heart surgery were firmly established, its use spread rapidly. However, in spite of the advantages offered by specialized equipment, certain lesions remained well-nigh inoperable due to their anatomical complexity. In order to extend the field of heart surgery, it was thought that hypothermia might be combined with perfusion. By cooling the patient to 10° C, blood circulation could be completely arrested and the catheters withdrawn from the heart. The surgeon could operate in an absolutely bloodless field, free from encumbering tubes. This technique permits the patient's circulation to be arrested for 60 minutes. However,



DEWALL OXYGENATOR

V.C.S. — Superior vena cava *V.C.I.* — inferior vena cava *Démousseur* — defoaming chamber *Bain à T. contrôlée* — controlled temperature bath *Artère fémorale* — femoral artery *Pompe* — pump *Sang* — blood *Arrêt cardiaque* — cardiac arrest.

it involves certain risks and should be reserved for the correction of otherwise inoperable lesions, such as the complete transposition of large vessels.

In the discussion that follows the commoner congenital and acquired diseases will be reviewed, with particular emphasis on physiopathology, prognosis, management and and surgical results. These data are based on personal experience from 1958 through 1963 at the Hôtel-Dieu and Ste Justine's Hospital.

Interventricular Septal Defect

This is a congenital or acquired abnormality in which the two ventricles communicate through an opening in the septum.

In order to understand the physiopathology of such intercommunication, it is necessary to recall the following principle: *pressure* is the product of *resistance* times *flow*. The importance of the shunt, that is, the quantity of blood passing abnormally from one circulation to the other, is dependent upon the pressure gradient from one side to the other of the orifice in the septum. Before birth, pulmonary resistance is very great and equal to the systemic resistance. The pressure is nearly the same on both sides of the interventricular septum, the output of the two ventricles is the same, so that when there is an interventricular orifice there is very little exchange of blood between the two ventricles.

Following birth, pulmonary resistance decreases resulting in a lowering of the pressure in the right heart producing a left-right shunt, that is, abnormal passage of blood from the left to the right side of the heart. The significance of the shunt depends on the size of the interventricular opening. Leakage of blood from the left ventricle leads to left ventricular insufficiency which is the most frequent cause of death in infants with a large interventricular septal defect.

Infants with such a defect will pass through this critical period in one of the following ways:

1. By a reduction of the diameter of the interventricular opening. This reduction may, but rarely does, lead to complete closure of the interventricular orifice;

2. by development of pulmonary stenosis through hypertrophy of the right ventricular muscle at the level of the crista superventricularis, which is a muscle pad at the outlet of the right ventricle;

3. by an increase in the peripheral pulmonary resistance through vasoconstriction. This results in hypertension in the pulmonary circulation and the right heart.

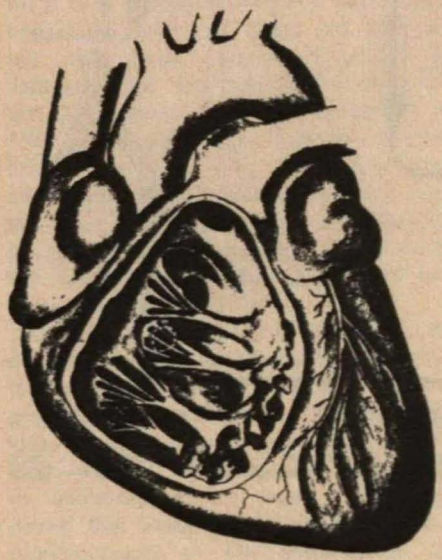


Fig. 1 Interventricular communication

All three reactions lead to a reduction of the left-right shunt. Infants with a large interventricular defect have an average survival rate of 15 years. The ultimate cause of death is right ventricular insufficiency and hypoxia, secondary to pulmonary arteritis which increases pulmonary arteriolar resistance above the resistance of the systemic circulation and reverses the left-right shunt so that venous blood mixes with arterial blood causing cyanosis.

If the interventricular opening is small, the child will not suffer from cardiac insufficiency but as an adult he will experience asthenia at the least effort and may fall victim to bacterial endocarditis.

The treatment of interventricular septal defect is closure by open heart surgery before the shunt is reversed. The operation is performed when the child is about three or four years old since the risks at an earlier age are prohibitive. In an infant with cardiac insufficiency who does not respond to medical treatment, palliative surgery must be resorted to. This involves narrowing the main pulmonary artery by insertion of a Teflon ring, a procedure which increases pulmonary resistance and reduces the left-right shunt, thus protecting the left ventricle against cardiac insufficiency. Nevertheless, this is an exceptional measure which involves serious risk and should be attempted only after approved medical treatment has been tried. Most infants with this form of cardiac insufficiency respond quite well to medical treatment. Narrowing of the pulmonary artery is a source of serious technical difficulties for the surgeon who later has to perform corrective surgery.

We have performed narrowing of the pulmonary artery on five infants with cardiac insufficiency who failed to respond to medical treatment. Four of them are developing normally; one died. We intend to perform open heart surgery on the four living patients at about age four in order to close the interventricular opening and eliminate the induced pulmonary stenosis.

Surgical treatment of interventricular septal defects is reserved for children with clinical symptoms since it involves a serious risk.

In addition to the complications inherent in all major operations, the correction of interventricular septal defects involves certain specific risks. The incision into the ventricle should be as short as possible so as not to interfere with the heart function during the postoperative period, particularly if the patient has pulmonary arteritis which increases pulmonary pressure and thereby the cardiac load. The incision must also spare the coronary arteries which are essential for proper myocardial vascularization. Cutting might result in infarcted areas leading to myocardial insufficiency and possible death.

If the opening in the interventricular septum is small, it can be closed by simple silk sutures. If it is large, the edges cannot be joined by sutures since the tissues would tear under the tension. A piece of plastic, such as Ivalon or Teflon (commercial polyvinyl products), is used as a patch over the interventricular orifice. During suturing, there is some risk of

touching the bundle of His which is responsible for conveying intracardiac nerve impulses and for coordinating auricular and ventricular contractions. It passes just below the membranous portion of the septum ventricularum cordis. Unfortunately it is unrecognizable among the other myocardial fibres. Ninety per cent of septal lesions are located in the membranous septum and, in a fair number of patients, the bundle of His will be touched by the stitches. The resulting damage may lead to temporary or permanent paralysis according to the severity of the trauma. This paralysis of the cardiac nervous system is evidenced by atrioventricular dissociation when the ventricles beat independently of the auricles at a rate of 40 to 50 per minute. This slow ventricular rhythm, although it can maintain life in some patients, is usually incompatible with postsurgical survival. Electrocardiac stimulation is required to accelerate heart action so as to maintain a cardiac output compatible with survival.

In the presence of postsurgical atrioventricular block, cardiac electrodes are connected to a pacemaker that will continue to operate as long as the atrioventricular block is present. Reappearance of a sinus rhythm is often seen within the early postoperative days. In some patients the block, unfortunately, persists. It may cause sudden death by cardiac arrest.

We performed open heart surgery on 35 patients with an interventricular opening ranging in diameter from 6 mm. to 18 mm. Twenty-five of them are well; the systolic murmur has disappeared; the prognosis seems good.

Interatrial septal defect

This defect consists of an orifice between the two auricles resulting from an embryonic malformation of the septum atriorum. There are two types: the *ostium primum*, in which the lower edge of the opening reaches the level of implantation of the mitral and tricuspid valves, and which is usually accompanied by valvular deficiencies or abnormalities; the *ostium secundum* located in the centre of the septum atriorum and which does not affect the atrioventricular valves.

Due to the pressure gradient between the atria, blood passes from the left to the right causing pulmonary overload that induces pulmonary hypertension. The average life span of patients with this lesion is 32 years. Treatment by open heart surgery consists in closing the orifice either by means of simple sutures or with a piece of plastic (polyvinyl sponge). In view of the encouraging surgical results obtained and the seriousness of the lesion, we believe that the presence of such interatrial defect is an indication for surgery in children. The indication becomes increasingly imperative as the patient advances in age due to its usual complications of arrhythmia and pulmonary hypertension.

Air embolism was the severe and, at times, fatal complication that accompanied the correction of this lesion. It resulted from the passage of air from the open right atrium through the left atrium into the left ventricle during intra-atrial manipulation. The air thus introduced into the left ventricle was retained by the mitral valve. Ventricular contraction, which continues during surgery, expelled it into the aorta toward the viscera or the brain. In the latter, the effects of air embolism are manifested by neurological symptoms arising from diffuse cortical irritation. The patient has multiple localized paralyses and repeated convulsions. These phenomena may appear several hours after the operation, last a day or two, then, in most cases, disappear without leaving any sequelae. If embolism is severe, consequences may be more serious, such as deep unconsciousness and even anuria due to renal embolism. These complications have fatal results.

Air embolism has been eliminated by preventing contraction of the left ventricle during the repair of atrial lesions. Ventricular fibrillation is induced by means of an electric fibrillator. The electrodes are applied to the cardiac muscle as soon as extracorporeal circulation is established. After closure of the heart, sinus rhythm is re-established by removal of the electrodes and, if necessary, by applying a strong electric shock with a defibrillator.

Between the second and eighth postoperative day, signs of mitral stenosis can be noted. This is customary in all patients whose auricles have been surgically incised. Atrial arrhythmia in the form of extrasystoles or fibrillation appears, characterized by acceleration and irregularity of the pulse, occasionally accompanied by a slight lowering of blood pressure. Cardiac monitoring by means of ECG, throughout the postoperative period, permits diagnosis of the arrhythmia and a decision concerning its treatment. Usually it can be corrected by digitalization.

Of the 64 patients upon whom we have operated, two did not survive surgery. The results in the other cases have been excellent.

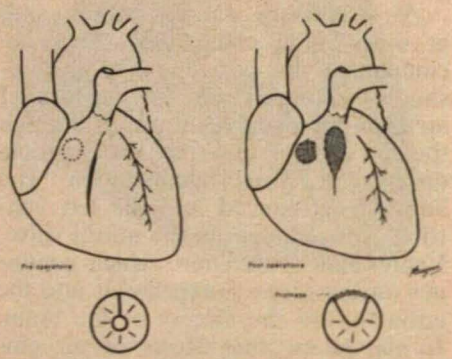


Fig. 2 Correction of tetralogy of Fallot Septal defect closed by prosthesis, outlet chamber of right ventricle enlarged by prosthesis.

FALLOT'S TETRALOGY

This is a complex lesion characterized by interventricular septal defect and pulmonary stenosis, usually infundibular, with right ventricular hypertrophy and dextroposition of the aorta. Right ventricular pressure varies according to the degree of pulmonary stenosis. If pressure is lower in the right than in the left ventricle, blood passes from left to right and the color of the patient's skin is normal. If pressure is higher in the right than in the left ventricle, venous blood passes into the left ventricle and the patient is cyanotic. These are the "blue babies" whose average life span is only 12 years if not treated.

Two types of surgery can be performed to correct this lesion. The first, which is palliative, is applicable to infants who are too small to have complete correction by open heart surgery and whose condition requires an increased pulmonary flow in order to ensure oxygenation of the blood compatible with survival. This is the Blalock-Taussig operation. It consists of the anastomosis of the subclavian to the pulmonary artery. This is the procedure of choice in infants with severe clinical symptoms of anoxia. It protects the child against repeated attacks of hypoxia and permits his survival during the first few years. It does not interfere with the success of the corrective surgery that will be necessary about age four or five. The subclavian artery can be visualized easily and ligatured when dissection is started at the arch of the aorta.

We have performed the Blalock-Taussig anastomosis on 21 patients under three years of age; 19 of them are relatively well. We intend performing open heart surgery when they are a few years older.

Corrective open heart surgery, reserved for children over four, consists of closing the interventricular opening with or without prosthesis, and removing the ventriculopulmonary barrier. This barrier, one of the elements of the tetralogy of Fallot, may be located at the pulmonary valve. Incision of the valve is sufficient to remove the obstacle. The barrier may be on the muscular ridge, the crista supraventricularis, which divides the right ventricle into an inlet chamber on the tricuspid valve side and the outlet chamber on the pulmonary valve side. Correction of this type of stenosis consists in widening the outlet chamber by resecting the muscle of the right ventricle or the hypertrophied muscle, or the insertion of a plastic prosthesis.

Infection is always to be feared in heart surgery since endocarditis may ensue as a result of ordinary contamination. It is dreaded even more during correction of the tetralogy of Fallot since it would produce sloughing of the prosthesis applied to the anterior aspect of the right ventricle. Hemorrhage causing the sudden death of the patient follows. Hence the necessity for the strictest asepsis in the operating room and administration of antibiotics in large dosages during the postoperative period. The presence of Fallot's

tetralogy justifies surgery since the prognosis for this lesion is very uncertain.

In our work, total correction by open heart surgery was performed on 24 patients ranging in age from 4 to 19 years, with good results in 20 cases. Five of the patients had previously undergone the Blalock-Taussig operation, and the results were excellent.

Congenital aortic stenosis

There are three types of congenital aortic stenosis: Valvular, supravalvular and subvalvular. Valvular stenosis results from the fusion of the semilunar valves at their commissures; supravalvular stenosis is due to stricture of the aorta at a point above the valve; subvalvular stenosis is caused by a fibrous diaphragm or by myocardial hypertrophy below the aortic valves. By increasing the resistance to the outflow of blood from the ventricle, this lesion creates a pressure gradient between the left ventricle and the aorta which produces an overload on the left ventricle leading to cardiac insufficiency. Sudden death is frequent in patients with aortic stenosis. A pressure gradient exceeding 50 mm. of mercury between the left ventricle and the aorta is an indication for surgery. According to the type of lesion, open heart surgery will consist of: resection of the diaphragm and incision of the fused commissures, or enlargement of the base of the aorta by means of a piece of Teflon.

We have encountered this type of lesion requiring surgery in seven children. One patient has a total postoperative atrioventricular block; the others are in good health.

Pulmonary stenosis

Pulmonary stenosis is the result of the fusion of the pulmonary semilunar valves. Severity of the lesion depends upon the degree of stricture. If it is very severe it will lead to early right ventricular insufficiency which is resistant to medical treatment. Nothing short of surgery can remove the pulmonary barrier. Unless compelled to perform an emergency Brock's transventricular valvotomy as a result of severe cardiac insufficiency, it is preferable to operate on such patients at five to six years of age under direct vision with the help of the artificial heart-lung. As in the case of aortic stenosis, the pressure gradient between the right ventricle and the pulmonary artery helps to determine the need for surgery. A gradient of less than 50 mm. of mercury is considered mild; a gradient of at least 50 mm. or more is indication for surgery.

We have successfully corrected this lesion in seven patients.

Acquired cardiac lesions

The incidence of involvement of the myocardium or the cardiac valves in rheumatic fever varies according to the age of the patients. Under 10 years, 50 per cent of the patients have cardiac sequelae following the first attack; between the ages of 10 and 20 the incidence is 25 per cent. Rheumatic fever is a very serious disease with considerable social impact. It must and can be vanquished. In Sweden today the disease is practically nonexistent.

After the acute stage which affects the heart as a whole — myocardium, endocardium, and even pericardium — the disease passes into the chronic stage during which all the cardiac valves may be progressively destroyed. In decreasing order of incidence, it affects the aortic, the mitral, the tricuspid and, more rarely, the pulmonary valve. Aschoff's nodules and inflammatory granuloma are found in the atrium of 50 per cent of patients operated on for mitral stenosis. The pathological process manifests itself by necrosis, accompanied by inflammation, fibrosis and calcification throughout the entire valvular system to a variable degree, possibly leading to stenosis and/or insufficiency (mitral valve disease).

Mitral stenosis obstructs the passage of blood from the left atrium to the left ventricle. Mitral commissurotomy by closed heart surgery is performed when the lesion produces cardiac symptoms.

Mitral insufficiency, which is much less common than stenosis, results

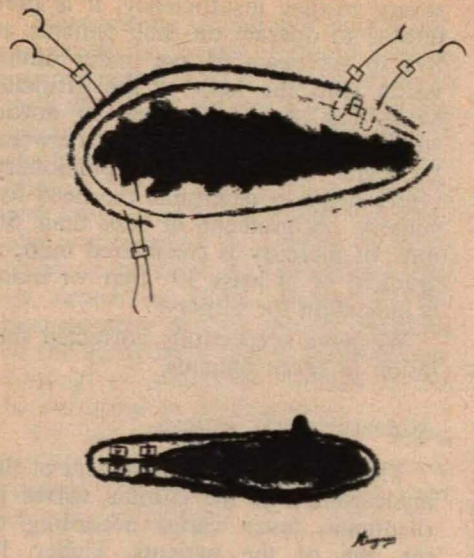


Fig. 3 Mitral valvuloplasty by a fold in the mitral annulus.

from the destruction of a valve by fibrosis or as the result of inflammatory changes and acute dilatation of the mitral ring. This lesion causes regurgitation of the blood from the left ventricle to the left atrium at systole thereby decreasing cardiac output and producing dilatation of the left side of the heart with cardiac insufficiency. The average life span of such patients is 50 years. Open heart surgery consists in reduction of the size of the mitral ring in order to restore valve competency.

Mitral disease is a combination of stenosis and mitral insufficiency and the symptomatology and treatment will depend on which lesion predominates.

In exceptional cases, complete destruction of the mitral system requires its replacement by a plastic prosthesis. This procedure is still quite new and some time must elapse before it can be evaluated.

We have performed mitral valvuloplasty on 24 patients and 21 are in good health.

Cardiac myxoma

In this condition, a tumor originates most frequently in the left atrium at the level of the interatrial septum. It may produce either cardiac symptoms due to obstruction of the mitral valve or peripheral symptoms because the tumor is friable and fragments may become detached and cause embolism. The diagnosis is established by angiocardiography and requires immediate surgical treatment.

It can be eradicated by open heart surgery. We have operated successfully on two patients with left ventricular myxoma both of whom had presented myxomatous embolism at the aortic junction.

Left ventricular aneurysm

Left ventricular aneurysm is a rare entity which occurs following a myocardial infarct. The infarcted portion of the wall becomes thin and forms a fibrous sac which fills with fibrin clots that can become detached and cause peripheral arterial embolism. The lack of contractility of the aneurysmal sac interferes with cardiac function and leads to irreducible left ventricular insufficiency. With the help of extracorporeal circulation, the aneurysm can be resected.

Such an operation was performed at the Hôtel-Dieu on a 64-year-old woman with irreversible cardiac insufficiency. Total resection of her aneurysm corrected her cardiac insufficiency and six months later she was carrying on her normal activities.

In addition to the specific complications already mentioned, there are others inherent in any major thoracic surgery. This means that particular watch should always be kept for premonitory signs of pulmonary complications such as atelectasis and pneumothorax. Acceleration of pulse and respiration, and elevation of temperature are indicators. A chest X-ray will confirm the clinical impression and the surgeon can then apply the appropriate treatment. Pneumothorax can be corrected by thoracic drainage; tracheal aspiration will eliminate the secretions responsible for bronchial obstruction.

Since these patients receive heparin preoperatively, hemorrhage is always to be feared postoperatively in spite of the use of an anti-heparin preparation (protamine sulfate or Polybrene). Excessively bloody drainage through

the pericardial or thoracic drains should be reported as soon as it appears in order to compensate for blood loss with adequate transfusion. However, hemorrhage can result from incomplete hemostasis and, in spite of thoracic drainage, can manifest itself by cardiac tamponade, evidenced by a lowering of arterial pressure, a rise in venous pressure with acceleration of the pulse and enlargement of the radiographic cardiac silhouette. Further surgery is imperative in order to decompress the heart and arrest hemorrhage at its source.

CONCLUSION

The principal cardiac lesions presently treated by open heart surgery have been reviewed. Surgical results are good in most instances. Since surgery aims at restoration of function, it is imperative that cardiac lesions be detected as early as possible so as to correct them before severe or irreversible cardiopulmonary damage develops which would increase the risks of surgery or even contraindicate it. Any patient with a cardiac murmur, even though he be asymptomatic, should be examined to evaluate accurately the pathology involved and to determine treatment. It may be added that most infants with cardiac insufficiency or severe hypoxia can be aided, if not cured, by timely surgery.

ANESTHESIA IN CARDIOVASCULAR SURGERY

THÉRÈSE CARTIER, M.D.

Light anesthesia and good oxygenation are the two factors that contribute to the success of cardiovascular surgery.

Cardiovascular surgery has made great progress in the past 10 years. At the outset, when we spoke of operating on the heart or on the large vessels, imaginations ran wild. It was even thought that the heart was removed from its natural position, sewn up and returned. Today laymen, and medical people alike, are familiar with the subject and take it in their stride.

More accurate methods of diagnosis, improved operating techniques and, we must admit, better understanding of anesthesia permits the surgeon to work introduction of a very light type of anesthesia permits the surgeon to work with ease, and causes minimal interference to normal physiological action. Vital signs remain unchanged except at specific moments during the operation; as for example, each time the heart muscle is touched with the scalpel, forceps or aspirator. Abnormal contractions occur, but are transitory and disappear rapidly.

As soon as surgery is decided upon, the anesthetist should visit the patient in order to determine special problems and find out the type of surgery required. The nurse should build up the patient's confidence from the outset by explaining how usual it is to operate successfully on lesions of this type. The anesthetist should continue this reassurance.

It is important for the patient to approach the great day without apprehension and, to this end, preoperative medication is given in two stages. The evening before operation, a barbiturate — usually Nembutal — ensures a good night's sleep. Phenergan, a tranquilizer that increases susceptibility to hypnotics and sedatives, is often given at the same time. In the morning, an

Dr. Cartier is an anesthetist at the Hôtel-Dieu, Montreal.

hour before the operation, morphine and scopolamine complete the preparation. Morphine is particularly effective because its sedative and analgesic properties reduce the amount of anesthetic required during the operation. Scopolamine depresses the cerebral cortex and produces euphoria.

It is the anesthetist's responsibility to ensure total oxygenation and complete elimination of CO_2. He must be careful to avoid depressing the central nervous system and must pay special attention to the problems peculiar to each lesion. Complete oxygenation is achieved by good pulmonary ventilation with 50 or 100 percent oxygen, by intubation and by controlled respiration.

"Controlled" means inducing respiration by rhythmic pressure on the bellows of the anesthetic machine. After a brief period of hyperventilation the patient quickly falls into apnea. This technique permits good oxygenation, and combined with small doses of anesthetic results in muscular relaxation offering the surgeon ideal operating conditions. Elimination of CO_2 is dependent on this good ventilation and the efficiency of the soda lime. Very light anesthesia causes unconsciousness and analgesia without depressing the cardiovascular nerve centre. It does not predispose the patient to fatal arrhythmia or harmful nerve reflexes.

No matter what anesthetic is used, it is administered in small doses. The patient sleeps naturally but without being able to awaken. Small amounts of Pentothal and curare are administered for induction and intubation. This is followed by a mixture of nitrous oxide-oxygen and a low concentration of Fluothane.

Fluothane is very helpful both because of its potent anesthetic qualities and because it can be administered without danger of explosion in conjunction with the use of the electrocautery. However, the same results can be obtained with ether, Anectine, pentothal and even Penthrane. These drugs are given in closed or semi-closed circuit with a high concentration of oxygen.

The nurse has an important role in cardiovascular surgery. In the operating theatre she watches the surgeon's movements closely; anticipates his needs; has equipment at hand to meet any contingency. A circulating nurse keeps an eye on the surgical team; assists the anesthetist; keeps a strict record of blood loss by weighing the compresses and checking the aspirators; is prepared to meet demands such as attaching a new bottle of blood, preparation of a medication or setting up a machine, such as the defibrillator or pacemaker. Improved techniques in nursing, surgery and anesthesia have opened the way to surgery for more seriously affected and older patients without endangering their chances of survival.

Nearly all examinations — catheterization, cardio-angiography, arteriography — require only good premedication, even for children and new-born infants. The Toronto Mixture (demerol-Phenergan-largactil) in carefully specified doses, suffices to make these little ones the most docile of patients. Aortography when performed through the lumbar region requires general anesthesia. Injection of the contrast medium is painful and the patient might move and compromise the result of the examination.

In surgery, the following problems are peculiar to each lesion. In operations on the large vessels, for example in correction of coarctation, aneurysm or thrombosis of the aorta, unclamping the vessel after operation causes the blood to flow suddenly into the lower extremities and arterial pressure may diminish dangerously. To prevent this the patient is placed in Trendelenburg's position, thus balancing the blood flow most effectively. The surgeon is asked to unclamp the vessel slowly thus restoring circulation gradually. In the case of patent ductus arteriosus, the surgeon obliterates it temporarily before incision and asks the anesthetist to check the patient's coloring so as to eliminate any possibility of an associated cardiac lesion. In mitral stenosis, we avoid giving too much intravenous fluid since we are dealing with a tired heart muscle.

Regardless of whether arterial surgery is performed on the limbs, kidneys or head, it is important to maintain efficient and stable arterial pres-

sure throughout the operation and during the ensuing hours in order to avoid the formation of new thrombi. Intravenous fluid containing neosynephrine hydrochloride is started during the early part of the operation and is continued after the patient returns to his room. The use of light anesthesia also applies to heart surgery involving extracorporeal circulation in the correction of congenital or acquired intracardiac lesions. Results are highly satisfying.

The patient who undergoes cardiovascular surgery under light anesthesia, even if prolonged, awakens as soon as the last skin suture is completed. He is in good condition and causes no problem to the recovery room staff or to those concerned with intensive nursing care. Vital signs must be checked and pain relieved. However, caution should be exercised, for analgesics depress the respiratory and cardiovascular centres, in particular. The patient is required to breathe deeply so as to permit full expansion of the alveoli and prevent atelectasis. He is encouraged to move and is helped to change position. Loss of blood and other body fluids is checked and orders are carried out meticulously.

The principles discussed in this article apply to adults as well as to children, with due allowances. Contrary to popular opinion, it is relatively easy to anesthetize infants, even those who are only a few days old and in physiological distress. It is really this distress that forces the surgeon's hand. With a large amount of oxygen and little anesthetic they come through surgery with surprising ease. It is very important to replace blood loss exactly since, owing to their small blood volume, babies can go into shock readily.

In premedication of infants, those less than six months old are given only atropine; older babies are given atropine and morphine; for over two-year-olds, premedication approaches that of an adult.

Nursing Care in CARDIOVASCULAR SURGERY

ADRIENNE AUDETTE

Nowhere are exact knowledge and competence of greater significance than in cardiovascular nursing.

Progress in the techniques of anesthesia has made feasible increasingly daring, delicate and dangerous surgical procedures. The introduction of synthetic materials paved the way to replacement of arteries of any size and even of heart valves. Open heart surgery has resulted in correction of numerous anomalies, congenital and acquired. The development of exploratory techniques in radiology or in the research laboratory presents almost limitless possibilities for the future in the study of disorders of the circulatory system.

Nursing care, composed of a multitude of seemingly insignificant but vital details, is an indispensable adjunct to either medical or surgical treatment. Failure to appreciate this fact can be highly detrimental to the patient, complicating or retarding his recovery.

To cooperate effectively, the nurse must know what the doctor expects of her. She must understand the reasoning behind and the significance of every move that she makes. She must be aware of the complications and

Miss Audette is assistant to the chief of the cardiovascular unit, Hôtel-Dieu of Montreal, and instructor in cardiovascular nursing in the school of nursing.

dangers inherent in various treatments in order to avoid accidents. She must be able to teach other members of the team correctly and, when required, teach the patient, since his active co-operation is an essential part of his care.

In the cardiovascular surgery unit of Hotel-Dieu of Montreal, the chief of service, who has wide experience in the field of circulatory disorders and who supervises both medical and surgical aspects of treatment, has set up the basic nursing measures required in this specialty. There are, of course, variations in the practical application of the suggested procedures but the underlying principles remain unchanged.

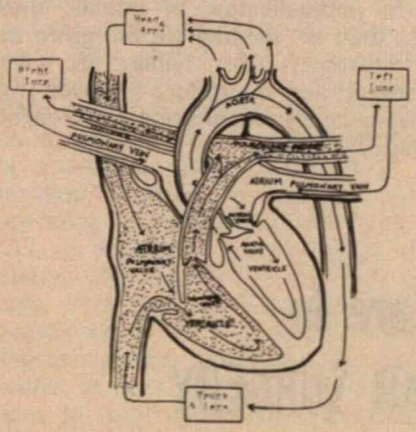


Fig. 1 Normal heart

Anatomy and Physiology in Review

Circulation of the blood is dependent upon a pumping organ, the heart, to start the flow through the arteries. The arteries subdivide into arterioles and capillaries which, in turn, unite to form venules through which blood leaves the tissues. The venules ultimately form veins whose function it is to return the blood to the heart.

The heart is muscular and its action can be compared diagrammatically to that of a pump. Each contraction of the left ventricle forces blood into the aorta for eventual distribution to the entire body. The heart itself is supplied by the coronary arteries. The arteries are responsible for the distribution of oxygenated blood to the entire body, with the exception of the lungs.

The arterioles play a major role in maintenance of body temperature and arterial pressure.

The capillaries, the smallest of vessels, provide for the exchange of essential materials between the blood and the cells.

The veins return the blood to the heart.

Lymph leaves the capillaries and returns to the heart via the lymphatic vessels, lymph glands, and thoracic duct, eventually reaching the subclavian veins.

All of the blood vessels are under the control of the sympathetic nervous system.

The Role of Surgery

Unquestionably, surgery can be of benefit in cardiac lesions as well as in arterial and venous conditions which form only a part of the over-all total. Nor is the field limited to blood vessels alone. Nerve surgery such as sympathectomy, plastic surgery such as Thiersch grafts on post-phlebitic ulcers, adrenalectomy for arterial hypertension are all involved.

In relation to nursing care, only the specific points related to the specialty will be mentioned. Details of a general nature, such as observing for vital signs and dosages of medications, should be familiar to the reader.

Surgical Cardiac Conditions

Remedial surgery can be carried out in anomalies such as patent ductus arteriosus; aortic stenosis; interventricular septal defect; interatrial septal defect; aortic coarctation, usually distal to the left subclavian artery; Tetralogy of Fallot which encompasses pulmonary stenosis, interventricular septal defect, hypertrophy of the right ventricle, transposition of the aorta and pulmonary artery and in various acquired lesions such as mitral valve stenosis.

Modern methods of diagnosis such as cardiac catheterization, angiocardiography, and laboratory procedures such as oximetry and chromatography constitute some of the main factors in the amazing progress made in cardiac surgery.

Diagnosis

Cardiac catheterization and angio-

cardiography are instrumental in establishing differential diagnosis.

Catheterization permits measurement of pressure in the various heart chambers. Since samples of blood can be procured from each one, study of the oxygen content is possible as an indication of septal or valvular defect.

In addition, angiocardiography, which involves X-ray of the heart and large blood vessels by injection of an opaque medium, can be helpful. This is not a particularly dangerous nor painful procedure though the patient requires considerable reassurance. No restrictions are necessary as a general rule, with the exception of several hours rest for the limb used for injection. Diet is unchanged.

Complications

Possible complications are *hyperthermia* with the same signs and symptoms as in a transfusion reaction, and *hemorrhage* at the puncture sites — one or both arms may be involved or the groin. The nurse must be absolutely sure of which areas have dressings and keep the patient under observation for four hours. *Phlebitis* may develop along the catheterized vessel. The usual signs are pain and a red streak on the skin surface following the path of the vein. In each instance, the nurse must be prepared to administer the care required.

Surgery

The type of intervention depends upon the type of lesion. Some defects can be corrected in a few minutes by simple suturing; others require implantation of a plastic prosthesis.

Two methods of surgery are in common use:

Closed circuit, where the procedure is not carried out under direct vision. A finger or an instrument is inserted intracardially and the heart continues to beat as, for example, in simple mitral commissurotomy.

Open circuit, where the operation is carried out under direct vision, using extracorporeal circulation — the heart-lung apparatus.

Cardiac surgery is frequently curative but in some instances may be palliative only. However, it offers the patient hope for prolonged life and improved physical and intellectual performance.

Nursing Care

Preoperatively, the patient requires the usual physical preparation for the various diagnostic examinations involved. An atmosphere of calmness and confidence should be built up around him. Tests and surgical procedures should be explained adequately to allay fear.

Postoperative care consists of the measures used following any major operation and, in particular, those involving thoracic surgery. It is important to note heart rhythm; to check the thoracotomy drainage tube; to check color and temperature of the extremities because of the possibility of an arterial embolism in either arms or legs; to watch for any indication of cerebral embolism, such as abnormal position of the tongue, distortion of the mouth, difficulty in articulation, hemiparesis, etc.*

Evidence of any abnormality should be reported immediately so that treatment can be instituted without delay. Embolectomy is sometimes necessary. The more rapidly treatment can be carried out after vascular accident, the less serious will be the sequelae in the affected extremity: ischemia, loss of function, necrosis.

Breathing Exercises

Atelectasis is one of the main pulmonary complications to be feared following cardiac surgery. Prevention is largely dependent upon breathing exercises that the patient has been

* During operation a small clot may form in the auricle of the heart. At some point this embolus may reach the general circulation and lodge in an artery that is too small to permit passage such as in the brain or in the upper or lower extremities, depending on its nature. Following commissurotomy, an embolus affecting circulation in the limbs is the usual complication for which to watch while, after open heart surgery, one must watch for air embolism affecting the brain.

taught preoperatively. These exercises form not only a necessary but an obligatory part of postoperative care. The exercises must be started as soon as possible and repeated at frequent intervals despite the patient's pain or fear. The responsibility for helping the patient and for seeing that the exercises are carried out falls upon the nurse.

With open heart surgery, there must be greater awareness of the seriousness of pulmonary and cardiac complications. Once more, breathing exercises are essential.

Cardiac Complications

Adults are prone to develop arrhythmia. Marked slowing of the pulse may be indicative of atrioventricular block. A fall in arterial blood pressure with increased pulse rate and a rise in venous pressure points to acute cardiac insufficiency. These patients receive heparin during the operation (by injection or in the blood used in the heart-lung machine). As a result there may be pericardial involvement with development of cardiac tamponade. Signs include: increased pulse rate, drop in arterial pressure, venous congestion and a rise in venous pressure (the normal rate is 15-20 cm. of water). The venous pressure level is a determining factor in differential diagnosis between hypovolemia (low or decreased blood volume), acute cardiac insufficiency and cardiac tamponade.

Patients are taken to the intensive care or recovery unit following cardiac surgery. The immediate danger of complication is over by the time the patient returns to his own ward. Breathing exercises must be carried on systematically, although somewhat less rigorously than at first. To be effective there must be complete dilation of pulmonary alveoli. Respirations should be deep, slow, with full chest expansion, holding the breath for several seconds then breathing out very slowly and deeply. When repeated frequently these exercises induce a very pleasant feeling of physical relaxation.

Throughout this period, the nurse must avoid tiring the patient by having him up for too long at a time. She must be aware of the possibility of delayed arterial embolism.

ARTERIAL CONDITIONS

Any obstacle to the normal distribution of oxygenated blood throughout the body is associated with arterial disorders. There are congenital or acquired disorders of the non-obstructive type, such as aneurysm, arteriovenous fistula and dilatation. Obliterative conditions include emboli or thrombi and chronic obstruction resulting from stenosis and hardening of the arterial wall, most often as the result of arteriosclerosis and various forms of arteritis. In addition there are various vasospastic conditions and, more rarely, inflammatory processes and infections.

Disorders of the arteries inevitably lead to gangrene of the extremities. For example, if the lumen of the femoral artery decreases, the blood continues to reach the toes but with considerable difficulty and much reduced pressure. Circulation in the limb, especially in the feet and toes, slows down; there are color changes — the toes are pale and feel cool. Complete obstruction of the artery will cut off blood flow entirely and direct it toward collateral arteries so that it reaches the foot and toes with considerable difficulty. If obstruction develops slowly, collateral circulation builds up and compensates temporarily. Proper nutrition of the whole foot is doubtful under such uncertain circumstances. Sudden, acute obliteration of an artery leaves no opportunity for development of a collateral blood supply. Gangrene quickly follows leading to probable amputation, unless treatment can be instituted very soon after the vascular accident occurs.

Signs of acute obliteration indicating need for emergency treatment are: paleness, sometimes cyanosis, of the extremity; toes and foot or fingers and hand are cool to the touch; absence of arterial pulsation (pedal and posterior tibial in the foot; radial and cubital in the wrist). The patient complains of pain, more or less marked loss of function, progressive loss of sensation (paresthesia) and dimin-

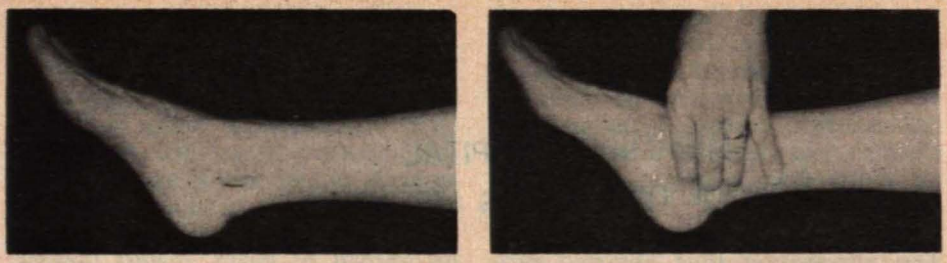
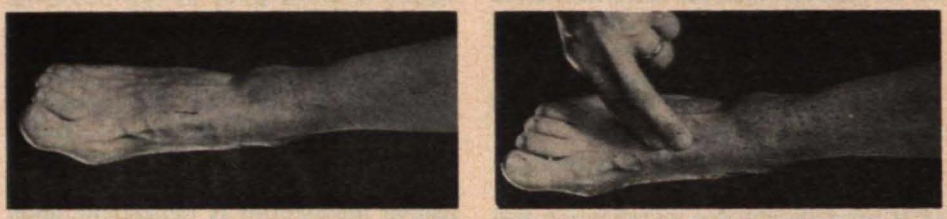


Fig. 2 Pedal and Posterior Tibial Artery Palpation



ished muscle power. Obstruction at the end of the aorta produces symptoms in both lower limbs in a more or less symmetrical fashion.

The sudden appearance of pallor, coldness, and the absence of a pulse in an extremity are signals that an emergency situation exists.

Diagnosis

Physical examination determines what condition is involved. Subjective symptoms, observation of skin color, checking the temperature of the extremities and palpation of the arteries are the main points to be considered. In clinical observation, and in the wording of reports, exact localization of the affected area is important.

Physical examination follows a specific routine. The patient lies flat on his bed with his limbs exposed. The color and temperature of the extremities are checked immediately, then again at the end of 15-20 minutes exposure to room temperature. The back of the fingers is used to test the temperature of toes, feet, fingers and hands. Radial and ulnar artery pulsation can be detected at the wrist while the brachial artery is palpated at the bend of the elbow. The dorsal pedal artery extends over the dorsum of the foot at the level of the first metatarsal head and outside the extensor muscle of the great toe. The artery can be palpated on the outer side of the foot opposite the head of the first metatarsal. The posterior tibial artery extends behind the internal or medial malleolus. It is usually very difficult to palpate (Fig. 2). Skin color may be white, pink, various shades of red or may have a bluish cast.

Oscillometry is another addition to the battery of tests. It is used to check arterial pulsation in various areas of the limbs where arteries are too deep to be palpable, for example, the middle third of the thigh; the lower and upper third of the leg; the lower third of the forearm and arm.

In cases where arteriography cannot be carrier out, analysis of these different facts will give the specialist a reasonably good estimation of the condition of the arterial network of the limb.

In centres where a great deal of arterial surgery is performed, X-ray techniques in relation to blood vessels should be highly developed. Angiography is dependent upon introduction of a radiopaque substance into the circulation which then carries it throughout the system. As the medium reaches the affected area, X-rays are taken. To obtain an X-ray series of the limbs, the contrast medium is injected directly or by catheterization into the arteries or the aorta and the specific areas of involvement can then be visualized, thus presenting definite information about the condition of the major blood vessels, the rate of circula-

tion in them and the presence of collateral circulation. This procedure permits investigation of all segments of the arteries: the ascending aorta and its branches, carotid, vertebral, subclavian, and visceral arteries which include the renal, hepatic, splenic and mesenteric branches, and finally the arteries of both upper and lower limbs. The information thus obtained provides the surgeon with a total picture of the condition of the arteries before treatment is instituted, and permits objective scientific appraisal of the value of therapy. Such investigation is basic to the education of students and doctors in a teaching hospital.

MIRAMICHI HOSPITAL SCHOOL OF NURSING LIBRARY

The nurse's responsibilities for general and local preparation of the patient for radiographic investigation will vary according to the routines of the radiologist and the institution; the type of anesthesia, usually local, rarely general except in translumbar abdominal aortography. The nurse must be aware of the significance and importance of each little detail. For example, when abdominal aortography is ordered, the intestine must be as completely free of content as possible. Gas, fecal material or traces of barium from previous X-rays, can distort the X-ray picture of the arterial tree. The nurse should note the results of preparatory enemata and should make it her responsibility to remind responsible authorities of recent barium studies or myelography.

When the patient returns to his bed following angiography, the nurse must observe him closely for four hours:

1. Check dressings over injection sites. Hemorrhage or hematoma are possible sequelae.

2. Check the pulse in the limb used for the catheterization — posterior tibial or dorsal pedal in the foot; radial and ulnar at the wrist. This should be done q.15-30 min.

3. If the patient has had general anesthetic, check his vital signs as for any postoperative patient..

4. The patient should be on bed rest at first, then allowed up under observation.

Any abnormality in the patient's condition should be reported at once.

General Care

Cleanliness: The patient should be kept clean with particular attention to the affected extremities.

Protection against injury: Because of the impairment to circulation in arterial conditions, all injury to the extremities must be avoided. Areas such as heels, ankles, which are susceptible to friction from bedding, should be adequately protected. The patient must be warned to guard against injuries, even minor ones such as may be incurred in cutting his nails or wearing new, poorly-fitted shoes.

Avoid use of direct heat: Under no circumstances should heat be applied directly to a limb that has poor circulation. Even an electric bed cradle, hot water bottle or similar contrivance stimulates cell metabolism. Since effective metabolism is dependent upon an adequate oxygen supply and since the circulation in the arteries is appreciably reduced, the supply of oxygen is insufficient for the needs of the limb — even under normal environmental conditions.

With direct heat, there is particular danger of burning the patient since tactile sense is frequently sharply diminished. A burn on a limb with poor circulation is an open door to gangrene.

Essential points for the nurse to observe in patients with vascular conditions are color, temperature, and arterial pulsation in the affected limb. In examining one limb, the other should also be checked for purposes of comparison.

TREATMENT

Histamine Therapy

Histamine dilates the small blood vessels. The patient receives an injection into an artery of 2.75 mg. of histamine phosphate in 250-500 cc. of glucose or saline solution, often in conjunction with papaverine and an antibiotic. Selective vasodilatation is thus produced in areas where circulation is uncertain and the extremity endangered.

Arterial injection can be repeated at two to three day intervals for several weeks. A single injection may be spread over 48-72 hours through the use of a special catheter (Abbott's intracath or venocath) introduced into

the artery through cutdown technique.

Histamine therapy has produced excellent results in some cases by healing small gangrenous areas and relieving local discomfort. It has even been instrumental in avoiding amputation. The treatment can be repeated at the end of a few months if the condition of the limb warrants it. This is especially advantageous in instances where surgery cannot be attempted because of advanced age or poor physical condition.

Possible danger: A sudden drop in blood pressure which can be detrimental to the myocardium and may result in an infarct is the main concern. When too great a quantity of histamine is released into the general circulation, either as the result of too rapid injection or because of extensive arterial obliteration, the drug eventually reaches the heart in too great a concentration. A very sudden drop in arterial blood pressure must be avoided at all costs; uncontrolled circulatory imbalance can have serious repercussions on the heart and the brain (anoxia).

The nurse's responsibilities:

1. Recognize the danger inherent in this form of treatment (hypotension) and the means of avoiding it —a decreased rate of injection of the solution.

2. Do not leave the patient alone while the injection is under way. If the attending nurse must be relieved, she must make sure that her replacement is familiar with the treatment, its danger and the means of coping with it.

3. Check with the doctor concerning the level of blood pressure to be maintained.

4. Blood pressure and pulse should be checked every two minutes at the beginning of the injection, then every five to ten or fifteen minutes.

5. If the blood pressure drops below the level set, slow the rate of the drip. The usual rate is 30-40 gtt. per minute. Less histamine means less vasodilation and consequently more blood goes to the heart and brain while the blood pressure is being stabilized.

6. Since this is an intra-arterial injection, the solution must be given under pressure greater than that within the artery. This is produced by creating a vacuum in the bottle connecting with the solution.

The fact that the needle is correctly positioned in the artery can be verified by checking for arterial pulsation around the needle. A spurt of blood surging back up the tubing warns that the pressure of the flow of solution has dropped. Without adequate pressure to ensure proper flow, blood is likely to coagulate in the needle, depriving the patient of life-giving therapy. It is equally important to avoid accidental injection of the solution into adjacent tissues should the needle slip out of position. Subsequent tissue reaction, especially in the area of the femoral artery where only a very short section is available for puncture, can delay further histamine injection for several days.

When the intravenous injection has been completed, the needle must be withdrawn quickly and pressure applied over the injection site for several minutes in order to prevent a hematoma which would prevent further treatment. When a small calibre intra-arterial catheter is in use, constant supervision is necessary to prevent blood coagulation in it. The same principle in relation to arterial pressure and solution pressure is applicable.

It is interesting for the nurse to observe the effects of treatment. The patient is conscious of the sensation of warmth that envelops the limb and can be very specific concerning the level that it reaches. The level of skin flushing changes with progressive improvement in the circulation to the extremity. At first, flushing may extend only to the knee, then to mid-leg or down to the heel and even into the foot itself. The nurse should note all details carefully, such as the time of appearance of color changes — 35th, 46th minute, etc. — as well as signs of fatigue, pain, numbness.

Anticoagulant Therapy

This form of treatment is sometimes prescribed to prevent thrombosis or, at least to prevent extension of it.

Anticoagulants are dangerous drugs. Their action is not identical in all patients. Certain fundamental precautions should be observed in administration. To avoid errors in dosage when the drug is ordered intravenously, a tuberculin syringe provides a more exact measurement. The measured dose should be checked against the written order; it should be administered at the

time indicated; it should be charted only after it has been injected or, if it is in an oral form, after ensuring that the patient has swallowed it.

If, in spite of all precautions, an error does occur — or even if you only *think* that one has been made — notify the attending physician immediately, watch the patient very closely. It is human to err but unnecessary to endanger a patient's life through silence.

Surgery

Sympathectomy

The sympathetic nervous system distributes vasoconstrictor nerve fibres to the entire periphery of the body. These fibres have a vasoconstrictive action on most blood vessels and a stimulating action on sweat glands. Sympathectomy, which involves excision of a portion of the sympathetic nervous system, both ganglia and nerve fibres, is often the treatment of choice, sometimes the *only* form of surgical intervention that can be undertaken.

The operation results in suppression of vasoconstrictive action and marked peripheral vasodilatation. The area formerly affected by these nerve fibres becomes warm and dry. The nurse will find it interesting to observe the color and temperature changes in the extremities postoperatively.

Obliterative Vascular Conditions

Relief measures include: endarterectomy, thrombo-endarterectomy, thrombectomy and grafting, either by autogenous grafts (using the internal saphenous vein) or by replacement with synthetic materials such as Dacron and Teflon.

The surgical problem is the removal of gross obstruction to circulation in a limb or the viscera or the restoration of blood flow to as nearly normal as possible through vein grafting in an artery or use of a synthetic prosthesis. Such procedures require very exacting conditions.

The main complication, following such surgery, is new thrombotic formation in the grafted vessel or the one from which obstruction has been removed. The symptoms are those of acute arterial obliteration. The nurse must observe the color and check the temperature of the affected extremity; arterial pulsation must be noted, in the wrist for upper extremity surgery, in the foot for lower extremity intervention. If the abdominal aorta is the vessel involved, check both lower limbs. Arterial blood pressure must be checked frequently. A drop in blood pressure means a slowdown in circulation, with increased danger of coagulation.

Amputation

When all other measures fail, amputation may become a necessity. After removal of toes or of a foot, the patient must not put his leg in a dependent position until the doctor gives permission. Following an above-knee amputation, stump movements are not only permitted but are necessary, beginning the evening of operation or the next day. The stump is sometimes elevated on a small pillow in order to stimulate return circulation, and assist in preventing phlebitis — a possible complication whenever venous circulation is impaired.

The most practical dressing is one that swathes the whole stump. Ordinarily, a sterile towel is folded up over the area and held in place with a broad band of adhesive. To avoid stump edema the band must not be tightened in the groin area.

Miscellaneous

After operations in the cervical area such as sympathectomy, first rib resection, surgery on blood vessels, thymus, parathyroid and thyroid glands, the surgeon frequently orders that the head of the bed be lowered below the level of the feet for 24-48 hours. A *small* pillow may be placed beneath the head. This position facilitates bronchial drainage. Secretions drain towards the mouth and can be expectorated with little effort. The nurse must not give in to the patient's pleas to raise the head of the bed, nor add an extra pillow. The patient's comfort may be affected for a few hours but his well-being, and the peace of mind of the surgeon is assured.

Veins and Lymphatics

Any obstruction to the return flow of blood to the heart may lead to ve-

nous abnormalities: varicosities; phlebitis, which in turn may lead to thrombus formation and the development of phlebothrombosis with subsequent danger of pulmonary embolism; thrombophlebitis and sequelae such as edema, sclerosis, induration and ulcer; edema. Some forms of leg edema — often confined to one leg only — can be of lymphatic origin. Lymph bathes the tissues and has a role to play in the exchanges that occur between the tissue cells and the circulating blood volume. The total amount of blood and lymph is limited and must be in continuous circulation for proper body function. Various conditions may affect the lymphatic circulation. Once again, signs appear in the extremities. The nurse must know how to distinguish between conditions of venous and arterial origin.

Diagnosis

This is based upon clinical examination. It may be necessary to resort to radiographic techniques in order to arrive at a specific diagnosis. Contrast medium is injected through a cutdown into the back of the foot or the ankle. It is carried by the return circulation towards the heart. Preparation of the patient requires only general cleanliness and local skin disinfection. Following the procedure, the puncture site must be inspected for bleeding and the affected limb checked for edema, diminished sensation or loss of feeling (especially when a hand is involved). The sutures of the venous cutdown are removed by the seventh day. In the presence of edema, the incision may reopen because of fluid pressure in the tissues. The wound must be dressed so that the edges are in firm apposition, no matter how small the incision may be.

General Care

Apart from individual differences and possibly climatic factors, impaired circulation is still the prime cause of venous thrombosis. The dependent position of the leg, while the individual is sitting or standing, is largely responsible for slowed venous circulation.

It is important to maintain as normal a circulatory rate as possible in patients who have venous abnormalities to prevent phlebitis. The foot of the patient's bed should be elevated two or three notches (about six inches). If he is confined to bed, he must exercise his legs frequently, putting toes, ankles and knees through a definite range of motion. When permitted out of bed, he must walk about, never stand in one spot.

To prevent venous stasis, the patient should have wide, elasticized bandages applied to his legs. Usually two rolls of bandage, four inches wide, are required. Later, when treatment has been instituted and the patient is convalescing, elastic stockings may be prescribed.

To be of use to the patient, the bandages must be applied correctly. Their purpose is to assist the return flow of blood to the heart by compression of muscles and veins. Bandaging should start at the toes, usually with three turns around the foot, three figure-of-eight turns at the ankle (Fig. 3), with the second bandage continued up the leg, turns crossed as in figures 4 and 5. The bandage turns are overlapped to provide firm support (not for esthetic effects) and to avoid uncomfortable folds of material. There should be firm compression of the foot, decreasing pressure at the ankle and the calf of the leg. Undue compression of the ankle and the lower part of the leg will slow venous circulation and may result in edema of the foot and toes.

The aim of this plan of general care is to stimulate return flow of venous blood to the heart; prevent slowing of the circulatory flow and venous stasis and thus prevent phlebitis and phlebothrombosis in the calf of the leg, with the probability of pulmonary embolism and its frequently fatal results.

There are certain small clinical signs which can aid in early detection of phlebothrombosis in the calf of the leg: unusual pain or sometimes simple discomfort of which the patient complains spontaneously or which may be induced by pressure or by dorsiflexion of the foot while the knee is extended. This pain is particularly significant if it occurs in *one* leg only. The nurse





Fig. 2 Fig. 3

Bandaging technique





Fig. 5 Fig. 4

should check unobtrusively for these signs in *all* postoperative patients, especially after abdominal surgery; in patients who have suffered injuries of various kinds; who have cardiac disease, or who are bedridden. Patients with cardiovascular surgery rarely exhibit postoperative phlebitis.

If pressure on the calf of the leg or dorsiflexion of the foot (Payr-Homans' sign) induces sensitiveness or unusual pain, there is every reason to suspect the presence of phlebothrombosis. The doctor should be notified so that a definite diagnosis can be established and treatment, sometimes of a preventive nature only, instituted as soon as possible. From time to time a nurse detects postoperative phlebothrombosis even before the patient complains of it. If every nurse were on the alert, this could happen with greater frequency.

Treatment

The use of anticoagulants in coping with venous thrombosis requires the same precautions as when prescribed for arterial conditions.

Compression Dressings for Ulcers

Obstruction of the normal return of venous blood to the heart means that the blood remains for a longer period in the veins. They may dilate forming varicosities; plasma and lymph exude into the fatty tissue causing edema. Induration of tissue in the lower part of the leg results. Hemosiderin, an iron-containing pigment in red blood cells, is deposited in the skin producing a brown pigmentation. The slightest injury, such as a blow from a hard object, an insect bite or especially a scratch may result in a wound that is hard to heal and has a tendency to reopen once healing does take place. This is a varicose or post-phlebitic ulcer.

To ensure rapid, sure healing of these ulcers, which so often occur in difficult sites such as behind or below the ankle or sometimes on the front of the tibia, the causes — venous stasis and the itching that accompanies it — must be relieved or eliminated. Compression dressings will help in the formation of healthy granulation tissue.

The value of the compression dressing lies in the *application of local pressure* not in the medication used. Compression encourages quick, even granulation. The gauze must be cut to the size of the ulcer to apply pressure to the base of the wound. Sometimes vaseline tulle, with or without antibiotic in ointment or liquid form, is used. If the antibiotic is in liquid form, it should be remembered that this is not a wet dressing. Use only enough solution to moisten it slightly. Ordinary gauze squares are applied

over the first layer so that they cover and extend beyond the borders of the ulcer. Asepsis must be preserved but the dressing should not be too thick. Shredded lint or several thicknesses of gauze cut to the size and shape of the ulcer are put in place as a final step. An elastic bandage is used to hold all in place. Be sure that the dressing is firmly in position before bandaging. Apply the bandage from the toes up; support the patient's leg comfortably for the procedure. With practice considerable dexterity is achieved in application of compression dressings. A good dressing is not a thing of beauty but it is comfortable. If the patient has more than one ulcer, each one must be dressed separately.

The appearance of the granulation tissue at the base of the ulcer when the dressing is done again will indicate whether or not compression is being properly applied. The wound becomes clean very quickly; it develops a rosy tint which later becomes red. The imprint of the gauze can be seen on an even layer of granulation tissue. Slight bleeding when the dressing is removed is indicative of a healthy wound — a good blood supply and therefore good nutrition.

Compression dressings are not particularly complicated to apply. Patients are frequently taught to do them and manage very well. In hospital, rigorous aseptic technique must be observed. Wearing sterile gloves is not necessarily the whole answer. Thorough hand-scrubbing with soap and water can be equally effective. A mask is not required for every dressing but the nurse must avoid talking, etc. over an open wound or an exposed dressing.

Surgical Techniques

In general these comprise treatment of varicosities, post-phlebitic conditions, vein ligature, etc.

Following venous surgery, the patient must exercise his legs as soon as possible and as frequently as possible, even if there is pain. Ankles, knees and toes should be put through a range of motion. The nurse must be firm in seeing that this is done and must provide assistance as necessary. The patient's fear that sutures will not hold must be relieved. It should be emphasized that the more he moves about in this early stage, the more quickly the pain will disappear, the easier it will be to move and the less likely will be the danger of phlebitis.



Fig. 6 Results of compression dressing

Following such operations, the *foot* of the bed, not the knee gatch, must be raised two or three notches and the patient must not be permitted to dangle his legs over the side of the bed until the doctor gives permission. When he is finally allowed up — the time depends on the type of surgery — the patient must walk about, not stand or sit, returning to bed when he is tired. There is no restriction on the amount of walking but obviously his legs must be supported with elastic bandages. When grafting is required, the patient is not allowed out of bed beforehand nor afterwards for 10-12 days.

Conclusion

In 1859, Florence Nightingale commented in her *Notes on Nursing* that the most important practical lesson that nurses can be taught is *what* to observe and *how* to observe; which symptoms indicate improvement, which deterioration; which are the most important details, which are of lesser significance.

Particularly in the last decade, nursing has followed a pattern of development parallel to that of medicine but

Miss Nightingale's dictum concerning observations is just as pertinent today in relation to cardiovascular surgery where nothing can be left to chance.

In this specialty where every movement must be justified, where practical application of theoretical data can easily give rise to confusion, observation must be founded on exact knowledge. Many times, the alert, responsible nurse, concerned with her role as an intelligent collaborator with the doctor, will be in a position to verify how important it is for the doctor to be able to depend on her information or actions. The doctor and the patient have the right to rely upon the nurse's competence. Intelligent cooperation and efficiency are dependent upon a preliminary condition — knowledge in order to act.

BIBLIOGRAPHY

Cartier, G. E., Cartier, P. and Stanley, P. "Indications chirurgicales dans les maladies circulatoires," *L'union médicale du Canada*, 87:1294, 1958; 88:374, 1959.

Chartrand, C. and Stanley, P. "La circulation extra-corporelle et la chirurgie cardiaque," *L'union médicale du Canada*, 90: 1245, 1961.

Nightingale, F. *Notes on Nursing*, Montreal: J. B. Lippincott Co.

Surgery of the Heart and Large Vessels

PAUL CARTIER, M.D.

The development of cardiovascular surgery and its present success have exceeded all expectations. Operations which only a few years ago were considered miraculous feats are now performed as a matter of routine.

Many cardiovascular conditions were formerly considered inoperable. Once diagnosed, interest in them was purely clinical. This type of surgery has paralleled advances in other medical and allied fields. New methods of investigation, of anesthesia, research and patient care have all contributed to present progress. In short, its development has resulted from intelligent and well-coordinated team-work, upon which its daily success still relies. The nurse's collaboration before, during and after surgery is essential to the success of these operations which, only a few years ago, were avant-garde.

The most common surgical conditions, requiring closed heart operation, are reviewed here, as well as surgical defects of the aorta and its branches. Views on the nursing care of these patients are also included.

The persistence of the ductus arteriosus is one of the most frequent and best known of congenital malformations. Anatomically speaking this canal is a small artery lying between the arch of the aorta and the bifurcation of the pulmonary artery, next to the heart. (Fig. 1).

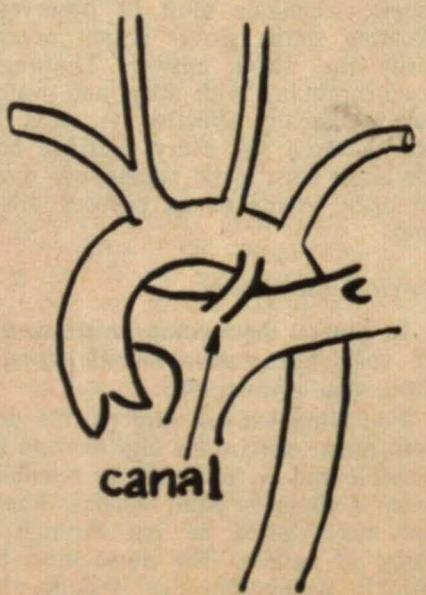


Fig. 1 Patent Ductus Arteriosus

Doctor Cartier is a member of the Surgical Service, Division of Cardiovascular Diseases, Hôtel-Dieu Hospital, Montreal.

Its function is to oxygenate the fetus inside the womb. After birth, it is of no further use and normally obliterates to form the arterial ligament. In a few individuals, however, this canal remains patent and creates a short circuit between the aorta and the pulmonary artery. Since the pressure in the aorta is much higher than that of the pulmonary artery, a considerable amount of blood will flow from the aorta into the pulmonary artery through this canal, causing strain which, in time, produces hypertrophy of the heart. Children stricken with this anomaly experience a slow growth pattern, fatigue and a predisposition to infection of the respiratory system.

Diagnosis is usually easy and can be determined clinically. A distinctive purring sound is heard over the 2nd and 3rd intercostal spaces. Sometimes the murmur can be felt by the nurse or mother as she holds the child against her. At the same spot auscultation will reveal a continuous systolodiastolic hiss like the noise of a steam-engine stopping at a station. Once you have heard this sound, you can never forget it.

This malformation can induce serious complications such as heart failure or endarteritis of the canal, and must be corrected surgically. The operation consists in division and suturing of the ductus. This measure will cure the lesion, the murmur disappears and the child resumes normal growth. The operation can be performed with little risk.

The special instruments used are worthy of attention. Thanks to Pott's forceps, cardiovascular surgery has become a safe procedure. This is a very delicate piece of equipment with small teeth that clamp the canal without traumatizing or slipping. This is important, since the least slip could cause sudden and fatal hemorrhage. The nurse responsible for the care of the instruments knows how frail they are and the scrupulous care required in handling them, since the least imperfection could lead to catastrophic results.

COARCTATION OF THE AORTA

Coarctation of the aorta is the narrowing of the thoracic aorta. This, also, is a congenital malformation. The stenosis occurs immediately below the origin of the left subclavian artery and is equivalent to clamping the descending thoracic aorta (Fig. 2).

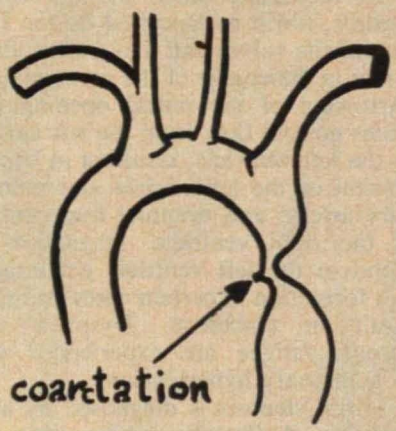


Fig. 2

The lesion is compatible with life since collateral circulation becomes highly developed and supplies the descending thoracic aorta lying immediately below the coarctation. This, however, produces hypertension in the upper part of the body and hypotension in the lower. This variation in arterial pressure facilitates diagnosis. It is also important to contrast the volume of the radial pulse with that of the femoral which tends to be weak or absent.

Coarctation results in serious complications arising from arterial hypertension: cardiac insufficiency; cerebrovascular accidents; endocarditis. The patient with this condition seldom lives over 40 years of age if not treated surgically. Surgery involves removal of the narrowed segment and end-to-end anastomosis of the aortic segments. If the stenosis is very large, a synthetic graft may be necessary. This is sometimes a long and arduous operation with constant danger of hemorrhage. In younger patients, however, risks are minimized since the operation is technically easier to perform. Consequently we recommend it for patients 8 to 12 years of age. Hypertension is corrected, the pulse in the lower limbs becomes normal and the patient is cured.

MITRAL STENOSIS

Mitral stenosis is an acquired valvular cardiopathy whereby the passage of blood from the left auricle to the left ventricle is impaired. It is caused by rheumatic fever.

In the acute stage of this endocarditis, fibrin is deposited on the free side of the valves and may induce their union in the course of the process. This narrowing of the mitral opening impedes normal flow from the left auricle to the left ventricle, resulting in hypertension of the left auricle and pulmonary artery, and eventual hypertrophy of the right ventricle. Stagnation of blood in the left ventricle encourages clot formation in certain cases and may result in embolism. Dyspnea and chronic fatigue are experienced due to pulmonary hypertension.

Mitral stenosis is diagnosed by auscultation. A diastolic rumble, often associated with a purring tremor or thrill, can be heard at the apex of the heart. The clinical diagnosis is subsequently confirmed by radiologic, electrocardiographic and hemodynamic examinations which help to determine the extent of damage.

Mitral stenosis, if not corrected, will lead to heart failure and the inherent risk of acute edema of the lung and peripheral embolism. Fortunately, modern surgery offers hope for this dismal picture. By separating the fused valves, mitral commissurotomy restores the opening to its normal size and elasticity. Once this is accomplished, pulmonary hypertension disappears and with it, dyspnea.

In mitral commissurotomy the surgeon's right forefinger is introduced through the auricle into the left atrium. Firm pressure is sufficient to fracture the commissures and dilate the stenosis permanently in some patients. In others, however, the mitral valve is so sclerosed or calcified that it resists attempts to correct the stenosis manually, requiring an instrumental approach. The instrument is introduced through the tip of the ventricle while the forefinger remains in the auricle to guide it.

Whenever the operation is considered technically satisfactory, convalescence progresses normally and results are most encouraging. Dyspnea disappears and, after a few months, the patient resumes activity denied to him for many years.

CONSTRICTIVE PERICARDITIS

The heart is contained in a membranous sac called the pericardium. When the sac is the site of an inflammatory process of tuberculous origin, it thickens and shrinks, imprisoning the cardiac cavities, causing constrictive pericarditis.

This sclerosed, non-elastic and often calcified thickening encircles the heart, restricts its movement and interferes with the filling phase of the cardiac cycle. This causes venous hypertension resulting in hepatomegalia, ascites and peripheral edema. The stricken patient suffers from dyspnea, oliguria and a marked decline in his physical capacities.

Total pericardiectomy, or excision of the pericardium becomes necessary to release the heart from the oppressive sheath and restore normal expansion and contraction. This long and difficult operation is performed through a sternotomy that exposes the pericardium.

Within the following days, there is improvement and, after a few weeks, the patient is considered cured. All signs of venous hypertension disappear and normal activities can be resumed.

SURGICAL DISEASES OF THE AORTA AND ITS BRANCHES

Progress in cardiac surgery has been paralleled by a similar advance in surgery of the large vessels. Detailed angiography, the discovery of synthetic grafts, and a better understanding of the evolution of lesions have broadened the field of cardiovascular surgery.

Atherosclerosis, the main source of diseases of the arterial system as a whole, is characterized by fatty or cholesterol deposits on the inner layer of the arteries. This can lead to occlusion, partial or complete, or destruction of the elastic fibres of the media and weakening of the arterial wall with dilatation and eventual aneurysm.

Although atheromatous diseases tend to cause general deterioration of the

arterial system, clinical evidence is usually related to one particular segment. This has been proved by repeated studies of angiographs revealing arterial obliterations and well localized aneurysms which apparently do not affect the rest of the arterial system. This is the case in Leriche's syndrome and aneurysm of the abdominal aorta.

Leriche's Syndrome

The syndrome encompasses the signs and symptoms generally observed in progressive and complete obliteration of the terminal end of the abdominal aorta and the beginning of the common iliac arteries. This bifurcation is situated opposite the umbilicus.

This type of occlusion develops very gradually so that collateral circulation becomes established sufficiently to assure a suitable blood supply to the lower limbs. Patients reaching their 50's, however, begin to suffer from intermittent claudication. This is a form of muscular cramp located mostly in the thighs, the buttocks and the hips, which affects the patient while walking and disappears when he is at rest. This syndrome also causes a lowering of sexual vitality in the male, due to a poor blood supply to the external genitalia.

Diagnosis is readily established by questioning the patient and is confirmed by a clinical examination to determine the absence or diminution of femoral pulsation. Aortography, moreover, determines with precision the extent of the aorto-iliac occlusion and indicates if surgical treatment is required. Obviously, we are dealing here with a serious disease which could degenerate into peripheral gangrene and progressive thrombosis of the aorta.

Since this thrombosis is located in the aortic bifurcation and leaves intact the vessels immediately above and below it, the only conceivable treatment is surgical resection of the bifurcation and its replacement by a Dacron graft in the form of a "Y." Vascularization can also be re-established by endarterectomy or removal of the obliterating body in the occluded segment. This procedure restores circulation in the lower limbs and remedies the intermittent claudication. Pulsation will reappear in the femoral, popliteal and foot arteries.

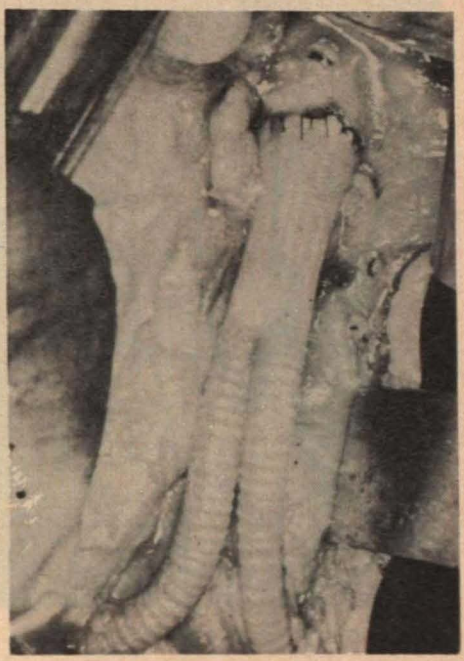


Fig. 3 Aortic Graft

It is evident that this operation is one of the most serious. Its long-range results are most encouraging, especially in cases affecting only the aortic bifurcation. Today, the implantation of a "Y" graft or endarterectomy are the treatments of choice for Leriche's syndrome (Fig. 3).

Ischemia of the Vital Organs

An atheroma occasionally settles at the origin of arteries in areas where the slightest ischemia can cause serious complications and even death. We are referring to the brain, kidneys and bowels.

The brain: Circulatory insufficiency of the brain due to arterial inadequacy often originates outside the cranium. It may arise at the division of the common carotid into the internal and external carotids at the angle of the lower jaw. It may also be located at the root of the vertebral arteries, a region which can be easily reached by the surgeon (Fig. 4).

The sites of the lesions are usually well defined, limited to one segment

and are caused by an atheromatous plaque which narrows the artery by three-quarters of its diameter and ultimately obliterates it, if not corrected in time.



Fig. 4 Carotid Artery — Atheroma

Some patients may have serious cerebral vascular accidents leading to hemiplegia with or without chance of recovery. These cases are not necessarily corrected by surgery because they are seen too late.

Many other patients will reveal so-called transitory signs of cerebral ischemia: temporary hemiplegia without sequelae, transient eye trouble (blurred eyesight), momentary aphasia, loss of balance, etc. These are the signs of a more serious cerebral vascular accident with possible sequelae. Clinical examination will reveal a systolic murmur at the angle of the jaw, indicating a narrowing of the internal carotid. This observation will later be confirmed by arteriography. It is most fortunate that this stenosis of the internal carotid can be remedied by vascular surgery. An endarterectomy will re-establish cerebral circulation to its normal state and thus eliminate all symptoms. These dramatic results will last for years.

The kidneys: A partial obstruction caused by an atheroma is sometimes found at the origin of the renal arteries. The narrowing is usually segmentary and affects only one side. The kidney becomes ischemic as a result of improper vascularization due to the narrowed artery. The deficient kidney, in turn, secretes a hypertensive hormone, causing serious hypertension that reaches the highest and lowest limits (250-140) (Fig. 5).

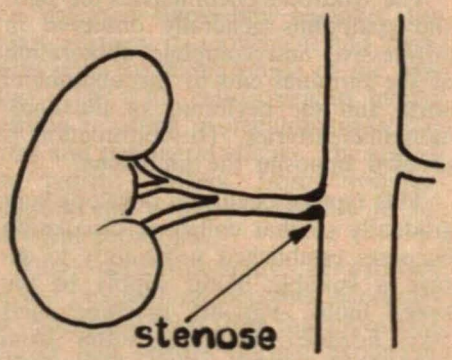


Fig. 5 Stenosis of renal artery

Diagnosis is not always easy. Certain symptoms should, however, point to this possibility: hypertension of recent origin; a difference in size between the two kidneys; the presence of an abdominal systolic murmur. The diagnosis can be confirmed only by renal arteriography which will also indicate whether surgery is in order.

Once our primary conclusions are confirmed by clinical and radiological investigation, it will be possible to liberate the obliterated vessel or use a graft to revascularize the kidney and to correct the arterial hypertension and its complications.

The Intestines: Thrombosis of the mesenteric artery is often fatal. It is sometimes caused by a marked narrowing of the superior mesenteric artery which provides the blood supply to the small intestine, where massive thrombosis begins. Ischemia of the intestine (also called abdominal angina because the pain occurs after meals) must be detected before this complication sets in. Since the disorder causes pain after a heavy meal, relief can be found by taking small meals several times a day.

The patient also suffers from malnutrition. Auscultation of the abdomen will reveal a systolic murmur in the epigastric area. This stenosis can be successfully corrected by surgery (Fig. 6).

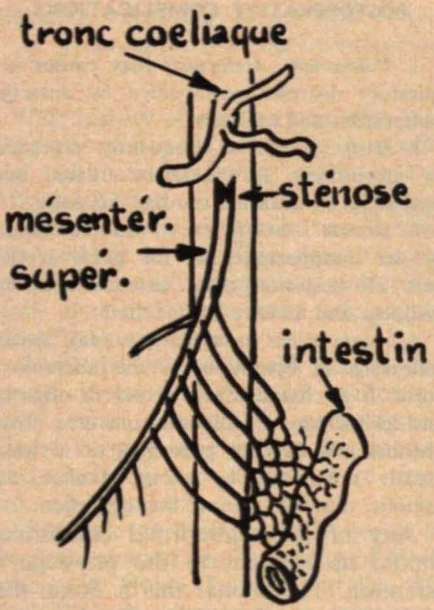


Fig. 6 Mesenteric stenosis

Aneurysms

The destruction of the elastic fibres of the arterial wall by the atheroma leads to a weakening of the vessel, a fusiform dilatation and, finally, aneurysm. These are found most frequently in the abdominal aorta (Fig. 7).

This lesion often remains asymptomatic until the moment of rupture, and then results in a dramatic situation. It can, however, be discovered accidentally in the course of a routine check. Palpation reveals a pulsating and expanding mass — *the distinct signs of an aneurysm*. The extent of the lesion can be determined by arteriographs.

Because of the danger of an unforeseeable rupture, aneurysms are referable to surgery. Needless to say, a ruptured aneurysm of the aorta requires immediate surgery, otherwise death is inevitable. Statistics show that the success of these operations depends on whether or not the aneurysm was operated on after or before the rupture. In the first case, operative risk is estimated at 50 per cent; in the second case, it is almost nil. The advantage of operating as soon as the lesion is discovered is obvious.

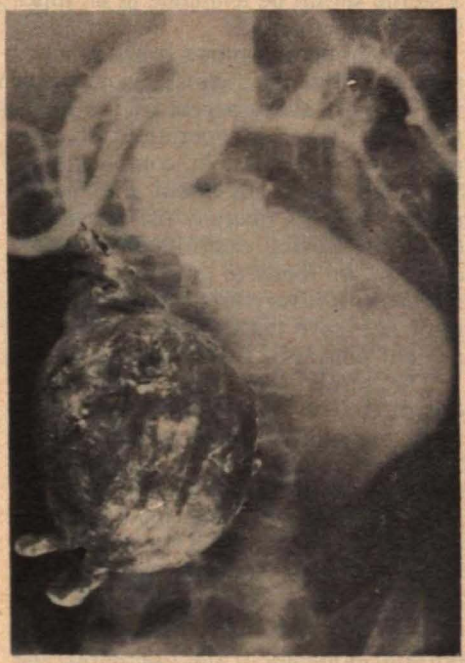


Fig. 7 Aneurysm of abdominal aorta

It must also be stressed that surgical removal of an aneurysm and its replacement by a synthetic graft requires clamping of the aorta below the renal arteries. Prolonged clamping can affect the function of the kidney and can result in acute renal insufficiency, the prognosis of which is always serious. This complication can be prevented and treated by using an osmotic diuretic during the clamping and after the surgery.

NURSING RESPONSIBILITIES

Cardiovascular surgery is considered a highly specialized field due to the novelty of its technique, its instruments and the care required by the patient. One cannot afford to resort to invention or improvisation. Every move must be predetermined and foreseen. Every minute counts and the life of the patient depends on it. The personnel responsible for nursing education understand the importance of these specialized aspects of their teaching.

In the Operating Room

Equipment and instruments will be

arranged the day before the operation. Emergency cases, like the rupture of an aneurysm of the aorta, demand that a sterile set-up be available at all times for immediate use.

The circulating nurse bears a heavy responsibility. She must be familiar with almost every aspect of the question: the type of operation, its importance, and possible complications. She must know all about the instruments, how to operate the apparatus (suction, Bovie, defibrillator, lamps, etc.) and be ready to provide the scrub nurse with everything required. She must not leave the O.R. during the important phases of the operation.

The scrub nurse must also be acquainted with the type of operation to be performed and its inherent risks. She is responsible for the sterile equipment and must watch for any possible contamination. A good knowledge of surgical technique and the surgeon's habits will help her anticipate the instruments required, thus saving precious time. Obviously, during the important moments of the operation, she must neither leave the operating room nor be replaced by another nurse.

Postoperative Care

This is substantially the same as for any other type of operation: observation of the vital signs; maintenance of intake and output of fluid; prevention of pulmonary atelectasis by respiratory exercises. Patients who have undergone thoracotomy will have an underwater thoracic drain to ensure removal of air and fluid from the pleural cavity, and to permit lung expansion. A Levin tube is also useful to prevent gastric retention.

POSTOPERATIVE COMPLICATIONS

1. *Pulmonary Atelectasis* may causes respiratory distress accompanied by anxiety, tachycardia and cyanosis.

2. *Heart failure* is frequently preceded by arryhthmia. It should be treated immediately by external cardiac massage.

3. *Arterial insufficiency* will be noted by the disappearance of the pulse at the foot or posterior tibial arteries and by coldness and lividity of the limb.

4. *Acute renal insufficiency* may occur following an operation on the abdominal aorta. It is characterized by severe oliguria and an increase in creatinin and urea. This phenomenon may be prevented or at least greatly minimized by using Manitol, an osmotic diuretic, during the operation.

Any of these abnormal conditions should be brought to the physician's attention. The sooner this is done, the easier it is to correct the complication.

CONCLUSION

After writing this article, I am more than ever convinced of the vital necessity of team-work in this type of surgery. The nurse who fully recognizes the importance of her role at the patient's bedside will share the surgeon's joy and satisfaction by having given her best.

CANDIDATES FOR CORONARY

Assessment of behavior and personality patterns can often identify in advance the man who is likely to suffer a heart attack before the age of 50, according to researchers . . . The personality pattern identified with greater proneness to an early heart attack is that of the hard-driving male of *excessive ambition and competitiveness*, who constantly works and lives under deadline pressures.

— *Heart Research Newsletter*

HEART TALK

An electrocardiogram, recently transmitted over regular telephone lines in a demonstration for the Société Médicale de Montréal, showed that Bell Data-Phone can be used to transmit physiological readings such as heart beats, muscle movements, fluctuations in blood pressure, etc. Medical specialists located in centralized diagnostic centres could receive such readings over the telephone, and send their interpretations and diagnoses without delay to the attending physicians. — *Bell Telephone News*

CONGENITAL HEART MALFORMATIONS

ANDRÉ DAVIGNON, M.D., F.A.A.P.

Pediatric cardiology deals with congenital or acquired cardiac pathology. The great majority of the lesions found in children are of congenital origin.

The history of modern pediatric cardiology can be said to have started with the publication, around 1936, by Dr. Maude Abbott of McGill University, of her atlas of congenital malformations which for the first time brought some order into congenital malformations that had never been adequately classified until then.

Until the end of World War II, the study of congenital heart malformations was essentially pathological, Heart surgery was still in its infancy and such cardiac lesions were considered inoperable.

Pediatric cardiology really began to progress toward the beginning of 1945 when Dr. Helen Taussig and Dr. Alfred Blalock succeeded in developing a palliative surgical technique for the treatment of Fallot's tetralogy, namely, anastomosis of the subclavian and pulmonary arteries. About the same time, Dr. Gross of Boston, who, in 1939, had for the first time successfully ligated a ductus arteriosus, surgically corrected a case of coarctation of the aorta. Finally, in 1953, Dr. Lillehei, of Minneapolis, performed the first open-heart surgery with the help of extracorporeal circulation. This operation was the starting point of modern heart surgery. These advances in surgery necessitated a parallel advance in the diagnosis and study of malformations. New techniques were developed for angiocardiography and for cardiac catheterization and there are now well-equipped hemodynamic laboratories in all major centres.

Pediatric cardiology has developed so tremendously that in the United States it was deemed advisable to raise it to the rank of a specialty with the creation of the American Board of Pediatric Cardiology. To obtain the Board's certificate, a physician must be competent in both pediatrics and cardiology, since it is considered that pediatric cardiology is quite different from adult cardiology and that it is preferable that the former be practised by pediatricians.

Dr. Davignon is in charge of the Hemodynamics Laboratory of Sainte-Justine Hospital in Montreal.

Incidence — Etiology

It is extremely difficult to estimate accurately the incidence of heart malformations — probably 0.7 per cent of live births. The etiology of most such malformations is as yet unknown, but it is sometimes possible to demonstrate certain factors that have affected the mother during the first trimester of pregnancy. The post-rubella syndrome (microencephaly, congenital cataracts, deafness, and ductus arteriosus) is very well known. Certain drugs administered to the mother can also cause fetal malformations, the outstanding example being thalidomide which, in addition to malformations of the extremities, also produces cardiopathies in a substantial proportion of cases. Though not yet definitely proven, it seems advisable to avoid all exposure of the mother to X-rays during the first months of pregnancy. Experimentally, a fairly high incidence of cardiac malformations can be produced in animal embryos by vitamin-deficient diets, by administration of certain chemicals (injection of Trypan blue), or by exposure to large doses of radiation. There is no evidence that these factors are effective in humans.

The heredity factor seems to have little influence on such malformations; only about 100 families are reported to have more than one child with malformations. Some malformations, such as ductus arteriosus and interatrial septal defects, occur chiefly in females, whereas coarctation of the aorta and

transposition of large vessels occur chiefly in males. In most cases, sex does not appear to be of great importance.

Signs in Malformations

Several signs can alert the physician to the presence of a congenital heart malformation. *Cyanosis* is well known. Its presence in a child suggests there is intercommunication between the systemic and pulmonary circulations with blood passing directly from the systemic to the pulmonary circulation. *Retarded growth* is very frequent, characterized by intercommunication between the two circulations with arteriovenous shunt. Such retardation may at times be so great that some French authors have designated it as cardiac nanism. *Dyspnea* is another very important sign; it manifests itself in the infant by acceleration of the respiratory rhythm during feeding which compels him to stop and take only a small quantity of milk at a time. *Profuse diaphoresis* on the slightest exertion is very frequent in such patients. This is a peculiar phenomenon observed almost exclusively in children and for which no explanation has been found. Some authors believe it is some sort of extrarenal mechanism of sodium excretion due to subclinical congestive heart failure. Children with congenital malformations who have a large arteriovenous shunt are also very sensitive to upper respiratory tract infections and the slightest cold can easily develop into bronchopneumonia or pneumonia. *Irritability* and *anorexia* are also noted. Finally, in association with cyanosis a peculiar phenomenon is noted: *squatting* on effort. The child takes a few steps, tires, squats down to recover his breath, and then is off again. This would seem to be a defence reaction aimed at temporarily affording a better supply of oxygenated blood to the cerebral circulation.

Some signs are pathognomonic of heart malformations. Absence of femoral pulse and hypertension in the upper extremities are evidence of coarctation of the aorta. A ductus arteriosus is usually revealed by a jerky pulse with a high differential blood pressure. The murmurs produced by aortic or pulmonary stenosis and by interventricular or interatrial septal defects are now classical and furnish a rapid diagnosis.

Diagnostic Procedures

Electrocardiography is undoubtedly the simplest procedure for the diagnosis of a congenital cardiopathy, and it should always be used. With the exception of certain malformations, it does not show the exact nature of the lesion, but merely indicates that heart cavities are enlarged and overworked.

The *vectorcardiogram* complements the electrocardiogram and helps define more closely certain electrocardiographic diagnoses such as right ventricular hypertrophy.

The *phonocardiogram*, another relatively simple test, helps the clinician with auscultation. It gives a permanent record of the various characteristic heart murmurs and helps to follow their changes from year to year.

Heart radiography, preferably after opacification of the esophagus by means of barium, is an essential complement of routine examination in such cases. It furnishes information on the size of the heart as a whole and of each of its cavities. In addition, the condition of the pulmonary vessels permit the radiologist and the cardiologist to judge whether the pulmonary circulation is reduced, normal or increased.

With the help of clinical examination, electrocardiography, heart radiography, vector and phonocardiography, an almost certain diagnosis can be made in the great majority of cases. Occasionally however, particularly when the symptoms are not the classical ones or if the patient must undergo open-heart surgery, the diagnosis must be definitely confirmed by more complicated tests, namely, heart catheterization and angiocardiography.

Heart catheterization consists of the introduction of a catheter through a vein or an artery into the various heart cavities. Blood pressure and oxygen level in the blood are measured in each cavity. Moreover, dyes can be injected through the catheter. Some of them are not radiopaque and, by measuring the time required for their appearance in the peripheral circulation and their maximal concentration, it is possible to ascertain whether or not there is intercommunication between the systemic and pulmonary circulations. Other dyes are radio-

paque. After these are injected into the heart cavities, films can be taken in rapid succession (cineangiocardiography) or at slower intervals (serioangiocardiography). This permits the delineation of the morphology of the various cardiac cavities and of the larger vessels.

Treatment

About seven out of ten congenital heart malformations found in children can now be completely corrected surgically with a high rate of survival. Some can be treated by closed-heart surgery, that is, without the use of an artificial heart-lung, the chief ones being ductus arteriosus and coarctation of the aorta. Others, such as, interatrial and interventricular septal defects, aortic or pulmonary stenosis, and abnormal return of pulmonary venous blood, can be definitely corrected only with the help of extracorporeal circulation. Unfortunately, only palliative surgery is available for the correction of certain malformations. Such is the case for transposition of large vessels where interatrial communication is set up, so as to assure a better mixing of the two circulations. In tricuspid atresia, anastomosis of the superior vena cava with the pulmonary artery is performed in order to increase the supply of blood to the lungs.

Conclusion

It goes without saying that the ideal conditions for the diagnosis and treatment of congenital heart malformations in children are to be found in a pediatric centre. A team of several different specialists (Fig. 1): cardiologists, physiologists, surgeons, anesthesiologists is essential. All these specialists require the assistance of competent nurses during heart catheterization, surgery, and especially during postoperative management which is extremely delicate. Numerous technicians and a well-equipped biological laboratory are essential for the proper functioning of the team. Finally, physiotherapists must be provided during the postoperative stage to help the patients with breathing exercises and thus prevent pulmonary complications.

It is only through the efforts of such complete teams that heart surgery can continue to advance, and to offer even better chances of survival.

Infant Care Following Cardiac Surgery

JACQUELINE TANGUAY

Since the mortality rate is high in the first 48 hours after surgery, it is essential that the nurse be competent, well-informed and observant.

Immediate Postoperative Care

The baby is transferred from the operating room to the intensive care unit in his bed; any infant weighing less than 10 pounds is kept in an incubator. To ensure adequate oxygenation and to help eliminate tracheobronchial secretions, humidified oxygen is administered in the croupette or incubator.

Position

While the baby remains unconscious, he is kept in a horizontal position; subsequently he is turned onto the side of the incision to facilitate thoracic drainage; later, he is moved from side to side every hour. Crying is not discouraged since it helps pulmonary expansion.

Complications

Possible complications include: hemorrhage, shock; acute cardiac insuf-

Miss Tanguay has a teaching certificate in surgical nursing from L'Institut Marguerite d'Youville and holds a responsible position on the infant cardiovascular surgical nursing unit at L'Hôpital Sainte-Justine, Montreal.

ficiency; obstruction of the upper respiratory tract by secretions.

Vital signs

These are of primary importance since they indicate the baby's condition and may reveal the imminence of a postoperative complication.

1. *Heart rate:* The cardiac rhythm is checked in the precordial area with a stethoscope. If the beat changes, becomes faster or irregular, it is advisable to install a cardiovisoscope; this apparatus gives swift and reliable information on the condition of the heart. The physician should, therefore, be informed at the first sign of change.

2. *Respiration:* This is one of the most important vital signs to observe. The slightest tracheobronchial obstruction or pulmonary congestion due to cardiac insufficiency immediately causes a modification in the infant's breathing. Respirations become more rapid or labored; they are characterized by pulsation of the alae of the nose and forced contraction of the diaphragm and intercostal muscles. At the same time, carbon dioxide accumulates in the blood producing an anxious facial expression and an accelerated pulse. Cyanosis may appear in the nails, lips and skin. The nurse must notify the physician so that he may correct the pathological factors involved.

3. *Temperature:* The nurse should control the temperature of the incubator in relation to that of the infant — which should be maintained at about 99° F. rectally. The physician should be advised if the baby's rectal temperature rises above 103° F. since this forces the heart to work harder. A rectal temperature below 98° F. should also be reported since it may indicate shock.

Thoracic Drainage

A thoracic drain is usually inserted to avoid accumulation of air and fluid in the rib cage. Care of the drainage apparatus is the nurse's responsibility. To avoid hemothorax, she should see the the fluid within the tube oscillates and that the tube is not kinked. To avoid pneumothorax, the tube must never be taken from the bottle; hemostatic forceps should be available to constrict the tube should it become detached from the bottle. To avoid contamination, all drainage equipment should be sterilized, including the water in the bottle. The drainage circuit should never be opened, and at no time should the bottle be lifted to the level of the thorax.

Pain

Although less sensitive to pain than adults, babies may suffer following this type of surgery mainly because of the separation of the ribs during the operation. Demerol or morphine is ordinarily prescribed for the first two days. Given in too large quantities, these drugs depress the infant's respiration, diminish his reflexes, and, as a result, prevent him from coughing; yet a suffering baby does not breathe adequately. The nurse should be able to evaluate the intensity of the pain so as to relieve the infant while avoiding harmful effects.

Physiotherapy

The physiotherapist may come several times a day and sometimes even at night to help the infant breathe. Coughing is forced to dislodge deep-seated secretions and cause expectoration. If this is not achieved, atelectasis may occur. In rare cases, when the baby is too weak to expectorate, it is necessary to carry out bronchial aspiration.

Later Postoperative Care

Diet

The baby is given nothing by mouth for the first 24 hours because of the danger of aspiration. Once peristalsis is well restored, usually the following day, the nurse begins to give him five to six cc. of water hourly; milk is added gradually, eventually reverting to his previous formula. Since fluid balance is of great importance, an accurate intake and output record must be kept.

As soon as the baby can be allowed out of oxygen, the nurse should take him in her arms when feeding him so that he will feel her presence and affection in place of his mother.

Medication

Antibiotics are prescribed routinely to prevent infection. Penicillin in large doses is added to an aqueous solution. Streptomycin is given intra-

muscularly b.i.d. Digitalis is prescribed as indicated.

X-ray

On the first postoperative day, an X-ray of the lungs is taken to determine the degree of lung expansion and detect pleural effusion, pneumothorax or emphysema. The nurse should help the technician place the baby in a horizontal or sitting position as required.

Convalescence

By the third day, the baby no longer needs intensive care and is returned to the ward where he will continue to receive special attention. The day before discharge, he undergoes an intensive examination; the results of this are compared to those obtained prior to surgery. The examination is useful in determining subsequent treatment, diet and activities of the infant. The cardiologist and surgeon then meet with the parents to explain the infant's condition and the care that he requires.

Conclusion

If the survival of infants with cardiovascular lesions is to be assured, the doctor must be aided by the nurse continuously. Any centre that handles infant cardiac surgery must maintain a nursing staff who are specialists in postoperative care.

LABOR RELATIONS INSTITUTE

The Committee on Labor Relations of the Association of Nurses of the Province of Quebec is planning a two-day Institute on April 17 and 18, to be held in the Queen Elizabeth Hotel.

Each year, the problems relating to working relationships between nurses and their employers — whether hospitals, public health agencies (governmental or private), private duty registries, or the public — continue to multiply.

Nursing is a "Public Service" under Labor Legislation and its ramifications reach into many aspects of our social structure. Nurses therefore, must become more fully aware of this situation and take means to understand the laws, contracts, agreements (written or unwritten) under which they practise their profession.

Firstly, nurses should understand their Nurses' Act and its by-laws, under whose authority they practise; *secondly*, they should know their position vis-à-vis the College of Physicians and Surgeons, the Hospitals Act, and the Hospital Insurance Service Act; *thirdly*, they should know their position under the Labor Relations' Act and the Public Services' Disputes Act. The Acts relating to labor legislation will all be included in the new Labor Code.

With this in mind, the A.N.P.Q. has decided to hold this two-day institute for *all* nurses interested in attending. It is planned to explain the operation of these Acts and their effect on nurses individually and as a profession.

Mr. E. Jacques Courtois, Q.C., counsel for the A.N.P.Q., will open the Institute by dealing with the Quebec Nurses' Act; Mr. Marc Lapointe, professor of industrial law, McGill University, will explain the operation of the Labor Acts, and Dr. John H. G. Crispo, assistant professor of industrial relations, University of Toronto School of Business, will speak on the attitude of the profession of nursing towards collective bargaining.

Nurses from other provinces are welcome. The registration fee will be $10.00.

NEW APPOINTMENT

In the February "Nursing Profiles," the new position of Mr. Harry McDonald was inadvertently omitted. Mr. McDonald is now the new Director of Nursing at the Colonel Belcher Hospital in Calgary.

THE WORLD OF NURSING

PREPARED IN YOUR NATIONAL OFFICE, CANADIAN NURSES' ASSOCIATION, 74 STANLEY AVENUE, OTTAWA

W. B. Saunders Fellowship

Once again the publishing company of W. B. Saunders is providing a Nursing Fellowship for a Canadian nurse seeking advanced preparation in nursing. Those wishing to compete for this $1,200 Fellowship should obtain application forms from the

Canadian Nurses' Association,
74 Stanley Avenue,
Ottawa 2, Canada.

Here are the terms of the Fellowship:

1. Candidate must be a Canadian citizen or in the process of obtaining Canadian citizenship.
2. Candidate must have received R.N. diploma or its equivalent prior to award.
3. The award shall be made to the person who, in the judgment of the Selections Committee, is likely to make the greatest contribution to Canadian nursing.
4. The award may be utilized at any recognized institution of higher learning for any course of study that may be related to the advancement of Canadian nursing as determined by the Selections Committee. Such course of study should constitute a year of full-time academic work.
5. The recipient must agree to complete one year of professional service to Canada following award year. Failure to do this, except for personal illness, would necessitate the repayment of the award under terms to be determined by the Selections Committee. These returned funds would be used for future fellowships.

ALL APPLICATIONS SHOULD BE RETURNED TO CNA NATIONAL OFFICE BY APRIL 30, 1964.

Return to Africa

Many nurses throughout this country will remember when 300 Canadian nurses went to Africa for service with the South African Military Nursing Service during the Second World War. Some of those nurses chose to remain in South Africa following the war.

The Springbok News Letter, published yearly, has a circulation of 300. This news letter is anxiously awaited by all ex-SAMNS Canadians, as it brings them the latest news of all their former colleagues and helps them to keep in touch with one another.

The "Return to Africa" Tour in 1964 is foremost in the minds of many ex-SAMNS Nursing Sisters. However, one need not be an ex-SAMNS to join the tour group. For further information about this tour and the Springbok Club write to:

Mr. J. S. McCannel,
Box 121, R.R. 2,
Ottawa 12, Ontario.

Architectural Barriers to the Handicapped

Through modern rehabilitation many of the half million handicapped citizens are in a position to live and work beside their more fortunate neighbors, yet drawbacks still exist. No signs greet the handicapped with warnings to keep out, yet architectural barriers are often as effective as signs.

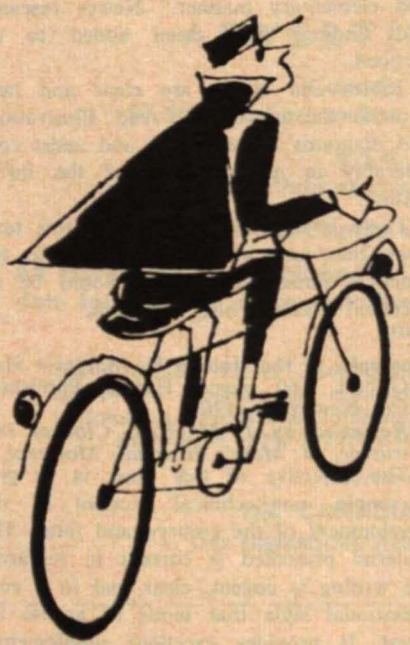
Concern over these architectural barriers prompted the Associate Committee on the National Building Code, National Research Council, to call an open conference of representatives from interested departments of federal

government and national organizations. This conference recommended that a supplement to the National Building Code be prepared containing the essential and desirable requirements to be incorporated into buildings to accommodate the handicapped.

The result — a special committee on Building Standards for the Handicapped is now preparing a special supplement to the Building Code. Miss FRANCES HOWARD, Nursing Secretary, Canadian Nurses' Association, represented the Association at the open conference, and is also acting as a member of the special committee.

It is hoped that the supplement will be ready by January 1, 1965 when the fourth edition of the Building Code is due to appear.

The National Building Code of Canada is an advisory document. It has no legal standing unless adopted by a municipality as a by-law. The special committee is taking the first step toward assuring the handicapped person of a place in the sun. It is not too early for us to begin the second step. We recognize the need. Let us now campaign. Often only minor changes, in either new or old buildings, would allow entrance by the handicapped — a ramp where steps prohibit entry; a hand-rail for safety and support. In this way the handicapped will enjoy all the privileges readily available to those not handicapped.



A real Paris policeman at the CNA convention in St. John's, Newfoundland, June 14-19? Well . . . not exactly, but just across the way at St. Pierre and Miquelon. Specially priced tours are being arranged from St. John's to this famous outpost of contiental France. So come along.
P.S.—Paris products at Paris prices.

HOSPITALS AND NURSES

Nursing is more than just a job. It is a calling to public service which exerts an immense appeal for young women, despite the personal sacrifice often involved. Why, then, are we faced with a serious shortage of nurses?

. . . Hospitals are bad employers, who frustrate the enthusiasm that recruits bring to nursing and drive numbers of them to give up in disgust.

Many hospitals provide extremely poor working conditions for their nursing staffs, who are underpaid, overworked, subject to an autocratic form of discipline and denied amenities that are standard in most other types of employment.

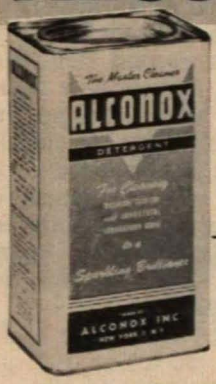
Perhaps worse, for nurses are a long-suffering lot, is that hospitals are inefficient in their use of nurses. They require dedicated and highly trained women to spend much of their time on menial labor which could be performed quite adequately by unskilled workers.

The hospitals may be satisfied with this state of affairs, but the public is not. When the shortage of nurses gets to the stage where wards have to be closed, it is clear that action is necessary. The problems of nurses have become more than a subject for narrow professional concern; the public interest is involved.

— *The Toronto Globe and Mail*

NURSES get all their instruments and equipment ABSOLUTELY CLEAN with

ALCONOX



WORLD'S FINEST Detergent

Ask your favorite supplier for Free Samples and Cleaning Guide

Keep stocked on our Companion Line

SPRAY PRODUCTS

Superior Quality at Low Cost

Spray Tincture of Benzoin
Spray Room Deodorant
Spray Skin Protector
Spray Bandage
Spray Skin Freeze
Spray Tape Remover

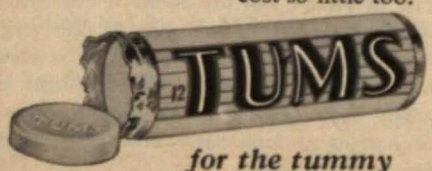
ALCONOX, INC., New York 3, N.Y.

NURSE...



what can I take for after-eating tummy upset?

The answer: TUMS! These mild, minty-flavoured tablets will give fast relief from heartburn, gas and the other discomforts of acid indigestion. Keep TUMS in mind when your patients ask this question. Remember TUMS bring fast, long lasting, safe relief . . . and they cost *so* little too.



for the tummy

About Books

First Year Clinical Notebook by P. M. Wilkinson, S.R.N., S.C.M., D.N., S.T.D. 128 pages. E. & S. Livingstone Ltd., Edinburgh and London, 1963.

This small book attempts to explain various diseases and procedures to first year student nurses who may encounter them without having had previous instruction about them.

Since it is a 'note'-book, abbreviations are used throughout. Principles of basic care that are taught in the classroom are omitted.

Nutrition for Practical Nurses by Phyllis S. Howe, B.S., M.E. 276 pages. Canada: McAinsh and Co. Ltd., 1853 Yonge St., Toronto. Ed. 3. 1963.

Reviewed by Mrs. Laura Khairat, director Central School for Practical Nurses, Winnipeg 10.

The author states that "This edition . . . again endeavors to present the basic principles of nutrition and dietetics in a concise and elementary manner." Newer research and findings have been added to all sections.

Tables and charts are clear and help to make the text easy to read. Illustrations and diagrams are excellent and assist considerably in understanding of the information.

There is more detail given in this textbook than one attempts to teach to the practical nurse students. It would be an excellent reference book for them.

Biography of the Unborn by Margaret Shea Gilbert. 160 pages. Hafner Publishing Co., New York. 1963.

Reviewed by J. MacNeil, Clinical Instructor, St. Mary's Hospital, Montreal.

The objective of this book is to give a simple, non-technical account of the development of the embryo and fetus. The material presented is current in research; the writing is cogent, clear and in a conversational style that tends to arouse interest. It provides excellent supplemental information since material dealing with fetal development in our obstetrical texts is usually sketchy and too technical. This text satisfies the need for that extra information in which students are interested.

Not only students and instructors will benefit from this book but the pregnant woman or anyone interested in the fact that "Man is an enigma. He is both one and many, individual and complex."

The Posey "V" RESTRAINT



A good all-purpose restraint to prevent patients from falling or getting out of bed. Particularly good for use on females as it does not irritate busts. Available in Small, Medium and Large sizes.

Posey "V" Restraint Cat. No. V-958 Price $6.90 ea. Posey Key-Lock "V" Restraint (Extra Heavy Construction, W/Riveted Joints and Key-Lock Buckles). Cat. No. VK-958. Price $19.20.

Send your Order Today — Dept. CNJ

J. T. POSEY COMPANY, 2727 E. Foothill Blvd., Pasadena, California.

EMPLOYMENT OPPORTUNITIES

ADVERTISING RATES

Canada and Bermuda:
$7.50 for 3 lines or less; $1.50 for each additional line.

U.S.A. and Foreign:
$10.00 for 3 lines or less; $3.00 for each additional line.

Rates for display advertisements on request

All advertisements published in both English and French issues. Closing date for insertion or cancellation orders, TWO MONTHS prior to date of publication.

The Canadian Nurses' Association has not yet reviewed the personnel policies of the hospitals and agencies advertising in the Journal. For authentic information, prospective applicants should apply to the Registered Nurses' Association of the Province in which they are interested in working.

Address correspondence to:

THE CANADIAN NURSE JOURNAL,
1522 SHERBROOKE STREET WEST, MONTREAL 25, QUEBEC

ALBERTA

Obstetrical Department Supervisor: Responsible for supervision of a 40-bed plus 37 bassinet department. Preparation in Ward Administration and experience required. General Hospital of 280 beds. School of Nursing. Located in a progressive and friendly city in sunny southern Alberta. Population 27,000. Excellent personnel policies including coverage for hospitalization, medical services and a pension plan. Write to: Director of Nursing, General Hospital, Medicine Hat, Alberta. 1-64-1A

Instructors — Nursing Arts; Sciences for a 3-yr. diploma program, 32 students enrolled annually. School is a part of a busy General Hospital of 280 beds located in a progressive and friendly city in sunny southern Alberta. Population 27,000. Bachelor's degree and experience required. Excellent personnel policies including coverage for hospitalization, medical services and a pension plan. Write to: Director of Nursing, General Hospital, Medicine Hat, Alberta. 1-64-1B

Instructor on Medicine for a 3 year diploma program, 32 students enrolled annually, School is part of a busy General Hospital of 280 beds located in a progressive and friendly city in sunny southern Alberta. Pop. 25,000. Bachelor's degree preferred. Excellent personnel policies including coverage for hospitalization, medical services and a pension plan. Write to: Director of Nursing, Medicine Hat General Hospital, Medicine Hat, Alberta. 1-64-1D

Registered Nurses for a busy 51-bed active treatment hospital, situated in east central Alberta. Salary range from $310-$355 commensurate with experience. Full maintenance in new nurses' residence for $30/m, sick leave and pension benefits available. 40-hr. work wk., 21 days annual vacation plus statutory holidays. For further information apply to: Miss Margaret MacIntosh, Director of Nursing, Municipal Hospital, Elk Point, Alberta. 1-34-1

REGISTERED NURSES (immediately) for new 70-bed hospital. General Duty positions in all departments; basic salary $340; liberal policies; excellent experience; active in-service Education program. Apply: Administrator, Providence Hospital, High Prairie, Alberta. 1-45-1

Registered Nurses for busy 44-bed active treatment hospital. Salary: $325 per mo. with bi-yearly increments. Excellent accommodation in recently opened nurses' residence. Medical and Hospitalization Group Plans. Liberal Holiday and sick schedule. Apply: Holy Cross Hospital, Box 339, Spirit River, Alberta. 1-81-1

Registered Nurses (2) for active 35-bed hospital in progressive town (1,100 pop.) on paved highway 80-mi. east of Edmonton, Basic salary $325/m with 3 annual increments to max. $370. Full recognition of past service taken into account when determining starting salary. Board and room $30/m, excellent working conditions. Write or phone collect, Director of Nursing, Municipal Hospital, Viking, Alberta. 1-91-1

Registered Nurses for new 50-bed Auxiliary Hospital. Basic salary $325/m with $15 yr. for 3 years. Past service recognized. AARN policy, M.S.I. and Blue Cross. Must live out. Apply: Matron, Wainwright-Provost Auxiliary Hospital, Wainwright, Alberta. 1-94-1A

Registered Nurses for General Duty (O.R. training helpful) for active, 20-bed hospital. Salary as per AARN schedule. Board and room $30, M.S.I. and Pension Plan. Please do not apply unless prepared to accept position. Apply to: Matron, General Hospital, Bow Island, Alberta. 1-11-2

General Duty Nurses for well-equipped 76-bed hospital in active town of 3,000. Salary $300-$350 for Alberta registered; $290-$340 for non-Alberta registered. New separate residence. Excellent personnel policies & working conditions. Apply to: Director of Nursing, Brooks General Hospital, Brooks, Alberta. 1-13-1

General Duty Nurses. Starting salary: $300 per mo., 40 hr. work wk. Room, board & laundry available, if desired, at nominal rates. Civil Service holiday, sick leave & pension benefits. Apply to: Baker Memorial Sanatorium, Dept. of Public Health, Calgary, Alberta. 1-14-3

General Duty Nurses (2) for modern 25-bed hospital on Highway No. 12. Salary range $340 to $385. New staff residence. Full maintenance $35, personnel policies include Blue Cross, M.S.I. and pension plans. 21 days' vacation per year, plus statutory holidays. Apply to the: Director of Nurses, Municipal Hospital, Coronation, Alberta. 1-25-1

General Duty Nurses (2) for 34-bed General Hospital. Salary $300-$345/m commencing at $315 with 1 year practical experience. Full maintenance at $35/m. Train fare from any point in Canada will be refunded after 1 year employment. Apply to: Municipal Hospital, Two Hills, Alberta. Phone 335. 1-88-1

Staff Nurse for duty with the Minburn-Vermilion Health Unit in the Vermilion-Lloydminster section. Public Health training desirable but not necessary. Car provided. For further information, apply to: Mrs. L. Braun, R.N., Senior Nurse, Minbeurn-Vermilion Health Unit, Vermilion, Alberta. 1-90-3

NURSES fully qualified for 30-bed active treatment hospital. New hospital building and recently renovated nurses' residence. Unless definitely interested in coming, please do not apply. Personnel policies sent upon request. Apply to: Mrs. M. Hislop, Superintendent, Municipal Hospital, Bassano, Alberta. 1-5-1

BRITISH COLUMBIA

O.R. Instructor for that part of student nurse course in O.R. techniques. Universtiy one year preparation in teaching and supervision preferred as well as O.R. experience. Please apply to: Personnel Director, The Vancouver General Hospital, Vancouver 9, British Columbia. 2-73-21

Nurses (2) — Lab Technician and Office Clerk. Opportunities for Christian service in a mission hospital of the United Church in northern British Columbia. Apply: Wrinch Memorial Hospital, Hazelton, British Columbia. 2-29-1

Psychiatric Unit: Nurses, preferably with P.G., for small new unit in General Hospital. Services coordinated with new mental health clinic. Apply: Director of Nursing, General Hospital, Kelowna, British Columbia. 2-34-1

HEAD NURSE for male medical and surgical ward — 23 beds. Policies in accordance with BCRNA. **General Duty and O.R. Nurses** with postgraduate course or equivalent experience required for 146-bed General Hospital. Personnel policies in accordance with RNABC. Apply: Director of Nursing, General Hospital, Chilliwack, British Columbia. 2-13-1

Head Nurse, male or female, for active Operating Room Unit. Postgraduate training required. Good personnel policies; residence accommodation available (female). Apply to: Director of Nursing, Trail-Tadanac Hospital, Trail, British Columbia. 2-72-1

Registered or Graduate General Duty Nurses for active 25-bed hospital. Salary B.C. registered $320 to start. Unregistered $305. RNABC personnel policies in effect, nurses' residence available. Apply: Administrator, Lady Minto Hospital, Ashcroft, British Columbia. 2-4-1

General Duty and OBS. Nurses for 69-bed hospital. B.C. registered $332-$366 — non-registered $317. RNABC policies in effect. Write giving particulars of age, training, and experience, with names for reference to: Director of Nursing, M.S.A. General Hospital, Abbotsford, British Columbia. 2-1-1

NURSING WITH

Medical Services Directorate



REGISTERED HOSPITAL NURSES
PUBLIC HEALTH NURSES
AND
CERTIFIED AUXILIARY NURSES

For service to Indians across Canada, Eskimos and the population of the Yukon and Northwest Territories.

Those interested in positions at the following locations should write to: Fisher River Hospital, HODGSON, MAN.; Miller Bay Hospital, PRINCE RUPERT, B.C.; Moose Factory Hospital, MOOSE FACTORY, ONT.; Norway House Hospital, NORWAY HOUSE, MAN.; Sioux Lookout Indian Hospital, SIOUX LOOKOUT, ONT.; Nanaimo Indian Hospital, NANAIMO, B.C.

Information on these and other positions is available from Medical Services Directorate, Department of National Health and Welfare, in Vancouver, Edmonton, Regina, Winnipeg, Ottawa and Quebec, or from the

Director, Personnel Services,

DEPARTMENT OF NATIONAL HEALTH AND WELFARE, OTTAWA

General Duty Nurses for active 30-bed hospital. RNABC policies and schedules in effect also Northern allowance. Accommodations available in residence. Apply: Director of Nursing, General Hospital, Fort Nelson, British Columbia. 2-23-1

GENERAL DUTY NURSES with B.C. registration for active 200-bed General Hospital with School of Nursing. Large expansion program under way. Personnel policies, including salary, in accordance with RNABC contract for 1964. Apply to: Director of Nursing, Royal Inland Hospital, Kamloops, British Columbia. 2-32-1

General Duty Nurses for fully accredited 82-bed hospital in northwestern B.C. 1964 salaries; B.C. Registered $347 - $419, Non-Registered $332. Room and board $50/m, 10 statutory holidays; 1-½-day sick leave, 4-wk. vacation, superannuation and Medical Plan coverage. Apply to: Director of Nursing, General Hospital, Kitimat, British Columbia. 2-36-1

General Duty Nurses for 110-bed hospital in northwestern B.C. Salary—B.C. registered $347-$419, non-registered $332. Newly furnished residence with T.V. Good social activities, including bowling, curling, tennis and year-round swimming. Full personnel benefits including travel allowance. Apply to: Director of Nursing, General Hospital, Prince Rupert, British Columbia. 2-58-2

General Duty Nurses for well-equipped 80-bed General Hospital in beautiful inland valley adjacent Lake Kathlyn and Hudson Bay Glacier. Initial salary $335, maintenance $50, 40hr. 5-day wk., 4-wk vacation. Boating, fishing, swimming, golfing, curling, skating, skiing. Comfortable nurses' residence, rail fare advanced if necessary. Apply: Sacred Heart Hospital, Smithers, British Columbia. 2-73-13

General Duty, Operating Room & Experienced Obstetrical Nurses for 434-bed hospital with school of nursing. Salary: $320-$387. Credit for past experience & postgraduate training. 40-hr. wk. Statutory holidays. Annual increments; cumulative sick leave; pension plan; 28-days annual vacation; B.C. registration required. Apply: Director of Nursing, Royal Columbia Hospital, New Westminster, British Columbia. 2-73-13

General Duty Nurses (2); Certified Nursing Aide (1) for 45-bed hospital. RNABC policies in effect. Friendly city with many social activities — fishing, boating, swimming, golfing, curling, skating and skiing. Apply: Director of Nursing Services, Fernie, British Columbia. 2-22-1

Graduate Nurses for 60-bed modern hospital in resort area on Vancouver Island. R.N. basic rate $332/m with yearly increments according to RNABC personnel policies. Enquiries: Director of Nursing, Campbell River & District General Hospital, Campbell River, British Columbia. 2-9-1

Graduate Nurses required for holiday relief in 60-bed hospital, V.I. resort area. Particulars to: Director of Nursing, Campbell River Hospital, Campbell River, British Columbia. 2-91-1

MATRON for 31-bed hospital. Salary $400/m with annual increments. 3-room furnished suite and board $33. Hospital fully staffed. B.C. registration required. Previous experience as Matron not necessary but applicants must have supervisory ability. Enquiries to: Chairman, Ocean Falls Hospital Board, Ocean Falls, British Columbia. 2-49-1

Graduate Nurses and Certified Nursing Assistants for 70-bed acute General Hospital on Pacific Coast. Salary for B.C. registered $320 with regular increments; unregistered $305; Nursing Assistants $214-$246. Board and room $25 per mo., 28-day vacation plus 10 statutory holidays after 1 year. Superannuation and medical plans. Apply: Director of Nursing, St. George's Hospital, Alert Bay, British Columbia. 2-2-1

Operating Room, Obstetrical and General Duty Nurses, British Columbia registered for modern 450-bed acute General Hospital, located on South Vancouver Island. Basic salary $320, credit for experience & postgraduate preparation, personnel policies in accordance with RNABC. For particulars write to: Director of Nursing Service, St. Joseph's Hospital, Victoria, British Columbia. 2-76-5

Nurses two for 30-bed hospital. Salaries as per B.C. Registered Nurses' agreement. Comfortable nurses' home Apply to: Miss H. Campbell, R.N., Director of Nursing. Community Hospital, Grand Forks, British Columbia. 2-27-1

CAMP NURSE for private Boys' Camp in Rockies. Excellent accommodation with opportunity to join all camp activities. July and August. Wages $150/m plus room and board. Apply: Rocky Mountain Boys' Camp, Invermere P.O. — British Columbia. 2-31-2

MANITOBA

Registered Nurses (3) for 20-bed hospital in Southwestern Manitoba. Salary $330 with 4 increments of $15, 40-hr.-wk., and 10 statutory holidays plus those declared by the town. Meals available. Apply to: Mrs. R. C. Steeves, Matron, Wilson Memorial Hospital, Melita, Manitoba. 3-37-1

Registered Nurse for 32-bed active, treatment hospital situated No. 1 Hwy. 200-mi. W. of Winnipeg. Salary $320-$370; equiv. 40-hr. wk., 3-wk. annual vacation after 1 yr. and 9 statutory holidays, resident accommodation at $45. Pension and Gr. Insce. plans; Apply: Superintendent, Mrs. L. Walton, District Hospital, P.O. Box 400, Virden, Manitoba. 3-67-1

Registered and Practical Nurses (immediately) for 18-bed hospital at Vita, Man., 70-mi. from Winnipeg. Starting salary, R.N. $330 L.P.N. $225 with allowance for experience Daily bus service. 40-hr. wk., full maintenance available for $50/m. Apply to: Matron, District Hospital, Vita, Manitoba. 3-68-1

Registered General Duty Nurses (2) immediately for fully modern 20-bed hospital. Salary: $330/m. Increments of $5.00 every 6 mo. for 8 increments. 40-hr. wk. Full maintenance available at the hospital for $45/m. For further information and application form apply to: Mrs. Olive Campbell, Matron, Hunter Memorial Hospital, Teulon, Manitoba. 3-63-1

General Duty Registered Nurse for 34-bed General Hospital. Salary $320-$360, 5-day wk. equivalent. Good personnel policies. For particulars contact: Director of Nurses, District Hospital, Souris, Manitoba. 3-58-1

General Duty Nurses (3) for new 85-bed hospital. Good salary and generous personnel policies. Apply: Director of Nursing, Portage Hospital District No. 18, Portage La Prairie, Manitoba. 3-45-1

ONTARIO SOCIETY for CRIPPLED CHILDREN

presents a challenge to Public Health Nurses

Applicants must have at least two years experience in a generalized public health program, preferably in Ontario.

INTERESTING AND CHALLENGING PROFESSIONAL SERVICES INCLUDE:

* rehabilitation of crippled children
* counselling of children and parents
* working with official health agencies

New attractive salary schedule with excellent benefits. Car provided. Pre-service training with salary.

Apply in writing to:

MISS MARGARET MacMILLAN, Reg.N.,
Supervisor, Nursing Service,
350 Rumsey Road,
Toronto 17, Ontario.



Timmy's friends need the help that YOU, as a District Nurse of the Society, could provide.

NOVA SCOTIA

General Duty Nurses for modern 35-bed hospital situated on beautiful South Shore. Good personnel policies. Excellent living quarters. Apply Superintendent, Fishermen's Memorial Hospital, Lunenburg, Nova Scotia. 6-21-1

ONTARIO

Instructresses-Medical, Surgical and Obstetrical areas. Postgraduate experience preferred. Positions to commence approx. July 1, 1964. Good personnel policies. Apply: Director of Nursing, St. Joseph's Hospital, Chatham, Ontario. 7-24-2

Registered Nurses for 34-bed hospital, min. salary $350/m. — max. of $450 in five years, 3-wk. vacation with pay, sick leave after 6-mo. service. **All Staff** — 5-day 40-hr. wk., 9 statutory holidays, pension plan & other benefits. Apply to: Superintendent, Englehart & District Hospital, Englehart, Ontario. 7-40-1

Registered Nurses. Applications and enquiries are invited for general duty positions on the staff of the Manitouwadge General Hospital. Excellent salary and fringe benefits. Liberal policies regarding accomodation and vacation. Modern well-equipped 33-bed hospital in new mining town, about 250-mi. east of Port Arthur and north-west of White River, Ontario. Po. 3,000. Nurses' residence comprises individual self-contained apts. Apply, stating qualifications, experience, age, maritals status, phone number etc. to the Administrator, General Hospital, Manitouwadge, Ontario. Phone 826-3251. 7-74-1A

Registered Nurses and Registered Nursing Assistants for well equipped 75-bed hospital in progressive town of 6,500, situated midway between Winnipeg and the Canadian Lakehead. Basic wage Reg.N., $330 and Reg. N.Ass'ts,$230/m with single room accommodation available in modern nurses' residence. Excellent personnel policies. For further information, please phone or write: The Director of Nursing, Dryden District General Hospital, Dryden, Ontario. 7-36-1

Registered Nurses, Certified Nursing Assistants (IMMEDIATELY) for 40-bed hospital in pleasant town of 5,000 42-hr. wk. with good rotation shifts, providing long weekends every 4 wks. Good salaries and personnel policies. For further details and application, apply: Administrator, General Hospital, Espanola, Ontario. 7-41-1

Registered Nurses and Registered Nursing Assistants for 29-bed, active treatment hospital. Registered Nurses $350-$390/m and Registered Nursing Assistants $230-$255/m with annual increments; living accommodation $45/m- 40-hr. wk., 3-wk. vacation after 1 year; 8 stationary holidays and other fringe benefits. Apply: Superintendent, Bingham Memorial Hospital, Matheson, Ontario. 7-77-1

Registered Nurses and Certified Nursing Assistants for 160-bed accredited hospital. Starting salary $350 and $240 respectively with regular annual increments for both. Excellent personnel policies. Residence accommodation available. Assistance with transportation can be arranged. Apply to: Director of Nursing, Kirkland & District Hospital, Kirkland Lake, Ontario. 7-67-1

Registered Nurses and Certified Nursing Assistants for immediate and future vacancies in this 42-bed hospital. Starting salaries $335 and $225, respectively. Accommodation in new residence available. Usual fringe benefits. For full information, apply to: Director of Nursing, New Liskeard and District Hospital, New Liskeard, Ontario. 7-83-1

Registered Nurses for General Duty in well-equipped 28-bed hospital, located in growing gold mining and tourist area, north of Kenora, Ontario. Modern residence with individual rooms; room, board and uniform laundry only $45. 40-hr. wk., no split shift, cumulative sick time, 8 statutory holidays and 28 day paid vacation after one year. Salary range $350 - $375. Apply to: Matron, Margaret Cochenour Memorial Hospital, Cochenour, Ontario. 7-29-1

Registered Nurses for General Duty in all departments including premature and new-born nursery, Isolation, Emergency, Recovery Room, and Intensive Care Unit. Good salary and personnel policies. Apply: Director of Nursing, Victoria Hospital, London, Ontario. 7-73-10

Registered Nurses for General Duty for well-equipped 42-bed General Hospital located in area known for its wealth of natural resources. The sportsminded person has unlimited activities to enjoy. Salary range $325 to $365 with increment for experience. Excellent personnel policies. Accommodation available in well furnished nurses' residence. For further information please phone or write: The Director of Nursing, General Hospital, P.Q. Box 909, Sioux Lookout, Ontario. 7-119-1

Registered Nurses for General Duty & Operating Room in modern hospital (opened in 1956). Situated in the Nickel Capital of the world, pop. 80,000 people. Salary: $325 per mo. with annual merit increments, plus annual bonus plan, 40-hr. wk. Recognition for experience. Good personnel policies. Assistance with transportation can be arranged. Apply: Director of Nursing, Memorial Hospital, Sudbury, Ontario. 7-127-4

Registered or Graduate Nurses for modern 100-bed hospital located in summer resort district, 40-mi. from Ottawa. Apply: Director of Nursing, Public Hospital, Smiths Falls, Ontario. 7-120-2

GENERAL DUTY REGISTERED NURSES for 200-bed hospital situated in a beautiful residential town on the shores of Lake Temiskaming. Starting salary $340, good personnel policies including 40-hr. wk., O.H.A. pension plan, etc. Accommodation available in residence if desired. For particulars apply to: Director of Nursing, Misericordia Hospital, Haileybury, Ontario. 7-54-1

General Duty Nurses for an accredited 66-bed hospital. Starting salary: 335/m. Excellent personnel policies, pension plan, residence accommodation only 10 min. from downtown Buffalo. Apply: Director of Nursing, Douglas Memorial Hospital, Fort Erie, Ontario. 7-45-1

General Duty Nurses for modern 100-bed hospital. Registered Nurses $325-$355/m, Graduates $285-$325/m, 40-hr. wk., benefits include accident, sickness and life insurance, hospital and medical insurance plans, & OHA Pension Plan. Apply: Miss Tillett, Director of Nursing, Leamington District Memorial Hospital, Leamington, Ontario. 7-69-1

THE HAMILTON AND DISTRICT SCHOOL OF NURSING

sponsored by

The Hamilton Health Association

Invites applications for the position of

INSTRUCTOR

QUALIFICATIONS—A University degree and graduate experience in one or more fields of nursing.

Eligibility for Nurse Registration in Ontario.

THE SCHOOL PROGRAM –

CONTROL—The entire curriculum to be planned and controlled by the school to provide an integrated program of instruction and practice.

EXPERIENCE AND PRACTICE—Will be provided in a number of different hospitals and other community health agencies.

LENGTH OF COURSE – 2 YEARS

The first class to be enrolled in the fall of 1964. This is an opportunity for teachers with originality and initiative to work cooperatively in setting up a new program.

For further information write to:

THE DIRECTOR,
Hamilton and District School of Nursing,
Box 590, Hamilton, Ontario.

General Duty Nurses for the summer months in resort town. Gross salary $325. Residence accommodation available. Apply: The Superintendent, Saugeen Memorial Hospital, Southampton, Ontario. 7-122-1

General Duty Nurses for 100-bed modern hospital, southwestern Ontario, 32 mi. from London. Salary commensurate with experience & ability; $325/m basic salary. Pension plan. Apply giving full particulars to: The Director of Nurses, District Memorial Hospital, Tillsonburg, Ontario. 7-131-1

GENERAL DUTY NURSES AND CERTIFIED NURSING ASSISTANTS for modern 32-bed accredited hospital in Northwestern Ontario. Good salary and personnel policies, including 8 statutory holidays, pension plan and usual fringe benefits. Single room accommodation in modern residence. Town of 6,000 in heart of vacation country; with excellent highway to the Lakehead. Apply: Director of Nursing, General Hospital, Box 970, Atikokan, Ontario. 7-5-1

General Duty Nurses & Certified Nursing Assistants for new 50-bed hospital with modern equipment. 40-hr. wk., 8 statutory holidays, excellent personnel policies & opportunity for advancement. Tourist town on Georgian Bay. Good bus connections to Toronto. Apply to: Director of Nurses, General Hospital, Meaford, Ontario. 7-79-1

Graduate Registered Nurses for floor duty, Head Nurse with Unit Administration training, (Female) for 70-bed active and Chronic Hospital in resort area. Starting salaries on regional basis, excellent personnel policies. Apply: Director of Nursing, Huntsville District Memorial Hospital, Huntsville, Ontario. 7-59-1

Operating Room Nurses for general operating room work which includes cardiovascular, neurosurgery, genito-urinary, ear, eye, nose and throat and orthopedic surgery. Good salary and personnel policies. Apply: Director of Nursing, Victoria Hospital, London, Ontario. 7-73-10A

Public Health Nurses (Qualified) for generalized program, by Stormont, Dundas and Glengarry Health Unit located in the Seaway Valley area. Minimum salary $4,000. Annual increment. Allowance for experience. 5-day wk. Employer-shared (50-50) group insurance, portable OMERS pension plan, Ontario Hospital Insurance and P.S.I. coverage (medical, surgical and obstetrical plan). 3-wk. vacation, cumulative sick leave credits, one-half paid as bonus upon leaving after 3-yr. service. Generous car allowance. Reply in writing to: Dr. John A. Thomson, Medical Officer of Health, Box 1058, Cornwall, Ontario. 7-34-5

Public Health Nurses (qualified). Salary $3,800 - $4,800. Car allowance, employer shared pension plan and other benefits. Apply to: Mr. Allan F. Stewart. Secretary-Treasurer, Wentworth County Health Unit, Court House, Hamilton, Ontario. 7-55-14

Public Health Nurses (Qualified). Salary range $3,850 - $4,600, required in a generalized program in rural and semi-urban area adjacent to Metropolitan Toronto. Excellent working conditions including pension plan, group insurance, and transportation arrangements. Write: Dr. R. M. King, York County Health Unit, 64 Bayview Avenue, Newmarket, Ontario. 7-84-2

PUBLIC HEALTH NURSE REQUIRED FOR NIPIGON-RED ROCK AREA. Applicant must be registered in Ontario and hold a certificate in Public Health Nursing. Attractive salary schedule. Car will be supplied. Numerous benefits. Apply in writing to: Dr. W. C. MacPherson, Director, Port Arthur and District Health Unit, 93 Balsam Street, Port Arthur, Ontario. 7-106-3

STAFF NURSES and O.R. and OBSTETRIC NURSES for 220-bed accredited hospital with School of Nursing. 1963 salary scale $305-$345. Postgraduate premium $320-$360. Usual personnel benefits, plus proximity to Ottawa, Montreal and Northern New York State. Apply: Acting Director of Nursing SERVICE, Cornwall General Hospital, Cornwall, Ontario. 7-34-1

BERMUDA

Registered Nurses for Operating Room with operating room postgraduate course and/or experience, for 150-bed hospital. Travel allowance paid. For particulars, write: Matron, King Edward VII Memorial Hospital, Bermuda. 13-1-18

QUEBEC

NURSING INSTRUCTORS for large Nursing Assistant program. Apply, giving full particulars of training etc. to: The Director of Nursing Education, Verdun Protestant Hospital, 6875 LaSalle Blvd., Verdun, Quebec. 9-47-44

Assistant Head Nurses and Certified Nursing Assistants for 60-bed children's orthopedic hospital. Excellent personnel policies. Apply: Miss Flora M. Lamont, Reg.N., Administrator, Shriners Hospital for Crippled Children, 1529 Cedar Avenue, Montreal 25, Quebec. 9-47-42

SASKATCHEWAN

Pediatric Supervisor with postgraduate course — responsible for supervision of 30 bed unit and clinical instruction of students. New 193-bed General Hospital. School of Nursing — 60 students. Apply: Director of Nursing, Union Hospital, Yorkton, Saskatchewan. 10-141-1

Registered Nurses, Male or Female, for 500-bed modern General Hospital. General Duty positions available on general medical and surgical wards, pediatrics and maternity. Personnel policies comparable to Saskatchewan Registered Nurses' Association recommendations. Recognition given for experience. Must be eligible for Saskatchewan registration. For further information write: Director of Nursing Service, Regina Grey Nuns' Hospital, Regina, Saskatchewan. 10-109-7

Registered Nurses and Certified Nursing Assistants for modern 60-bed hospital, newly renovated and extended, new 20 bed residence, 40-hr. wk., pension plan. Differential, good salaries and personnel policies. For further information write: Director of Nursing, Moosomin Union Hospital, MOOSOMIN, Saskatchewan. 10-87-1

THE HOSPITAL FOR SICK CHILDREN



YOU RECEIVE THE ADVANTAGES OF:

★ FIVE-WEEK ORIENTATION PROGRAM FOR NEW STAFF

★ ONGOING INSERVICE EDUCATION FOR NURSES

★ EXTENSIVE STUDENT EDUCATION PROGRAM

★ RESEARCH INSTITUTE

APPLICATION FOR GENERAL DUTY POSITIONS INVITED

FOR INFORMATION CONTACT:

THE DIRECTOR OF NURSING

555 UNIVERSITY AVENUE, TORONTO, CANADA

Registered Nurses for Nursing Service and Nursing Education, for 150-bed, accredited new hospital, SRNA personnel policies. Apply to: Director of Nursing, Holy Family Hospital, Prince Albert, Saskatchewan. 10-103-1

U.S.A.

Registered Nurses for modern 374-bed General Hospital on the beautiful, warm Peninsula yet only 20-min. from the heart of cosmopolitan San Francisco. Openings in all nursing services including operating room, emergency room, and I.C.U. Excellent personnel policies, many extra benefits and opportunities for advancement. Telephone collect, OXford 7-4061 or write: Director of Personnel, Peninsula Hospital, 1783 El Camino Real, Burlingame, California. 15-5-20

Registered Nurses. Career satisfaction, interest and professional growth unlimited in modern, JCAH accredited 254-bed hospital. Located in one of California's finest areas, recreational, educational and cultural advantages are yours as well as wonderful year-round climate. If this combination is what you're looking for, contact us now! Staff Nurse entrance salary $395 with automatic increase to $455 per mo., supervisory positions at increased rate. Special area and liberal shift differentials paid. Excellent benefits including Blue Cross hospitalization and surgical coverage and liberal personnel policies. Professional staff appointments available in all clinical areas to those eligible for California licensure. Write today: Director of Nursing, Eden Hospital, 20103 Lake Chabot Road, Castro Valley, California. 15-5-12

Registered Nurses (2) for private practice in Southern California. Starting salary $385. Must report for work in 60 days. Contact: Mr. J. A. Woodruff, 10720 S. Paramount Blvd., Downey, California. 15-5-18

Registered Nurses for private 258-bed hospital for men, women and children. Staff Nurse salaries from $380-$450, differentials for evenings, nights, communicable disease, operating room and delivery. Opportunities in all clinical areas. Holidays, vacations, sick leave and health insurance. California registration required. Applications and details furnished on request. Contact: Personnel Director, Children's Hospital, 3700 California Street, San Francisco 18, California. 15-5-4

Registered Nurses for 233-bed modern hospital. Positions available — all services, no shift rotation. Liberal benefits, advancement opportunities, educational opportunities in area, equal opportunity employer. Apply: Director of Nursing Service, Kaiser Foundation Hospitals, San Francisco 15, California. 15-5-7

Registered Nurses General Duty for 230-bed approved teaching hospital, resort city. Starting salary $375 per mo. plus $22.50 shift differential, provision for housing allowance. Apply: Director of Nursing, Cottage Hospital, Santa Barbara, California. 15-5-39

Registered Nurses, Staff Nurses for permanent positions, various departments, days, eves., nights. Excellent starting salary, increments, benefits and working conditions in one of the largest and finest general hospitals in the West. For details write: Personnel Department, Queen of Angels Hospital, 2301 Bellevue Avenue, Los Angeles 26, California. 15-5-3G

GENERAL DUTY STAFF NURSES — Central California large General Hospital. Start $413/m. Excellent in-service education programs; liberal personnel policies, shift differential. Apply: Personnel Director, San Joaquin County, Room 530, Courthouse, Stockton, California. 15-5-36

(a) **Operating Room Nurses** (experienced); basic salary $385 with good financial reimbursement for call. (b) **Obs. Nurses** $385 basic salary with $20 differential for 3-11 or 11-7 shifts. (c) **General Duty Nurses** $375 basic salary, $20 differential for 3-11 or 11-7 shifts. Apply: Director of Nurses, General Hospital, Eureka, California. 15-5-14

Staff Nurses for 300-bed County Hospital. Attractive personnel policies plus differential for specialties, afternoon and night duty. Opportunities for advanced education. Apply to: Director of Nursing Service, Kaiser Foundation Hospital, Oakland 11, California. 15-5-3C

Staff Nurses for 100-bed County Hospital located in the progressive San Joaquin Valley. Salary: $395-$458/m. Starting salary depends on experience. $10 shift differential for evenings and nights. Occasional promotions to Head and Supervising positions. Liberal fringe benefits. Modern nurses' residence of nominal cost. Call or write: Director of Nurses, Tulare County General Hospital, Tulare, California. 15-5-44-A

NURSES Progressive hospital in San Joaquin Valley has openings for **R.N.'s.** Located between San Francisco and Los Angeles near mountain, ocean and desert resorts. Paid vacation, paid sick leave, voluntary retirement plan, paid Blue Cross, Credit Union. Salaries determined by experience and capabilities. Write: Personnel Director, Mercy Hospital, Bakersfield, California. 15-5-5B

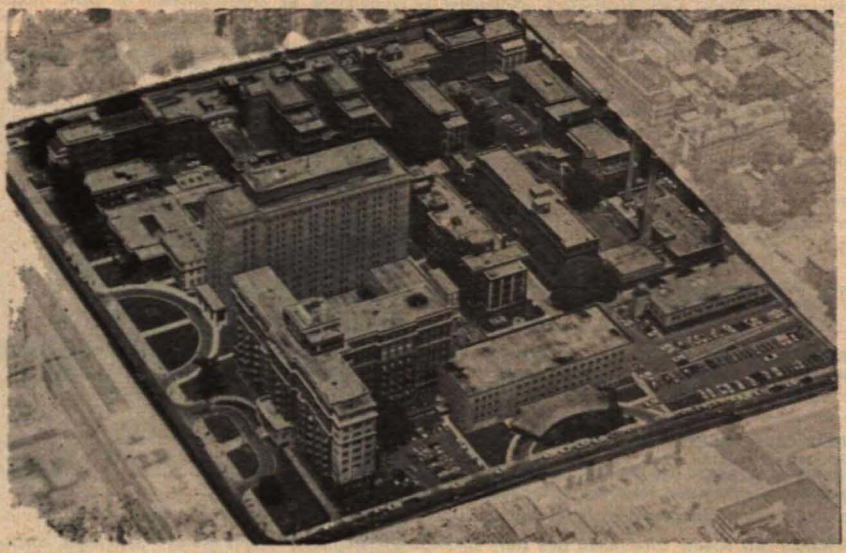
NURSES — ALL SHIFTS, ALL DEPTS. NEW ACCREDITED 99-bed hospital. Starting salary $405/m plus differential, liberal benefits. Contact Director of Nurses, Viewpark Community Hospital, 5035 Coliseum Street, Los Angeles, California. 90016 15-5-3M

Nurses for new 75-bed General Hospital. Resort area. Ideal climate. On beautiful Pacific ocean. Apply to: Director of Nurses, South Coast Community Hospital, South Laguna, California. 15-5-50

General Duty Nurses for various departments including surgery for 72-bed hospital. Starting salary $375 per mo. with periodic increases and fringe benefits. College town, tourist area, ideal climate. Contact: Superintendent, Luthern Hospital Association, Alamosa, Colorado. 15-6-1

Executive Director generalized public health nursing agency. Potential for program expansion in rapidly growing community 45 minutes from NYC. Staff 8 full time, 5 relief nurses. Master's degree, administrative ability; experience required, salary open. Send résumé to Mr. Charlees H. Ulrich, Chairman, Personnel Staff Committee, Visiting Nurse Association, 60 Guernsey Street, Stamford, Connecticut. 15-7-4

TORONTO GENERAL HOSPITAL



NURSING OPPORTUNITIES

for

REGISTERED NURSES AND CERTIFIED NURSING ASSISTANTS

Planned Orientation Programme — Inservice Educational Programmes
Opportunity to gain additional knowledge in specialized fields of nursing
Excellent personnel policies
Salaries commensurate with prevailing current salaries in Metropolitan Toronto

For information or application write to:

DIRECTOR OF NURSING, TORONTO GENERAL HOSPITAL,
101 College Street, Toronto 2, Ontario.

REGISTERED NURSES FOR GENERAL DUTY

in modern 20-bed hospital located in thriving Northwestern Ontario community. Starting salary $275 minimum to $325 maximum for three years' experience. Board and room in modern nurses' residence is supplied at no charge. Excellent employee benefits and recreational facilities available. Further particulars on request.

Apply, giving full details of experience, age, availability, etc., to:

EMPLOYMENT SUPERVISOR,
Marathon Corporation of Canada Limited, Marathon, Ontario.

U.S.A.

New York Polyclinic Medical School and Hospital in heart of Manhattan. Six month courses for qualified registered nurses in Operating Room Nursing, and Medical Surgical-Out Patient Department Nursing. Classes begin in March and September, include 220 hours of instruction and supervised clinical experience. Room, meals, medical care, and monthly cash stipend. For information write: Director of Nursing Education, 345 West 50th Street, New York, New York 10019 15-33-24

SUPERINTENDENT OF NURSES

Required by 18-bed Private Hospital. Ontario registration required.
Registered Nurse with supervisory experience or experience as Superintendent of small hospital would fill requirements. Two room apartment with bath and all meals suppied for $20 per month. Four weeks annual vacation per year, eight statutory holidays, hospitalization, medical-surgical and Group Insurance. Moving expenses up to $50 refunded following six months employment. Salary scale will be forwarded following application.

Apply to:

MRS. V. M. SWITZER, SECRETARY,
BOARD OF DIRECTORS, LADY DUNN HOSPITAL, WAWA, ONTARIO.

U.S.A.

General Duty Nurses for 54-bed hospital, minimum starting salary $350 per mo., located near Miami and West Palm Beach. Apply: Director of Nurses, Belle Glade Memorial Hospital, Belle Glade, Florida 15-10-3

REGISTERED NURSES: for 75-bed, air conditioned hospital, growing community. Starting salary $330-$365/m, fringe benefits, vacation, sick leave, holidays, life insurance, hospitalization. 1 meal furnished. Write: Administrator, Hendry General Hospital, Clewiston, Florida. 15-10-1

GENERAL STAFF NURSES for 425-bed private, General Hospital with completely modern facilities. Located in pleasant residential area near the Northwestern University campus and transportation to Chicago loop. Hiring range $5,040 to $5,400 for permanent personnel. Progressive personnel policies. Apply: Director of Nursing Service, Evanston Hospital, 2650 Ridge Avenue, Evanston, Illinois. 15-14-2

Staff Nurses (All Areas) Orientation and staff development programs, "nurse-saving" equipment, challenging working environment, individualized living accommodations in new air-conditioned cottages. Opportunity to participate in nursing practice of the finest quality in our 200-bed General Hospital, located along Lake Michigan shoreline, 30 min. from Chicago. Starting salaries $390-$410 plus $30 differential for 3-11 and 11-7. Write: Director of Nursing, Highland Park Hospital, Highland Park, Illinois for detailed brochure. 15-14-3

Staff Nurses and Licensed Practical Nurses (Openings in several areas, all shifts). Minimum starting pay $77 R.N.'s; L.P.N.'s $61 per wk, experience considered differentials paid for reliefs, nights. Every other weekend off in small community hospital 2 miles from Boston. Living quarters available. Contact: Miss Elizabeth A. Byrne, R.N., Director of Nursing, Chelsea Memorial Hospital, Chelsea, Mass. 15-22-1

Staff Nurses 380-bed hosp. new 120 med-surg. unit. Trans. pd. 1st class air to Albuq. and return within U.S. in exchange for 1-yr. emp. contract. Come to New Mexico "Land of Enchantment." Career opportunities, largest pvt. JCAH accredited hosp. in state; near U. of New Mexico, R.N. & B.S. pgm. Practical Nurse pgm. accredited state & NAPNE. Vacancies, Med-Surg. & occasionally O.B., Peds., & O.R., salaries $350 per mo. even., night or O.R. with call; 6-mo. increases up to $410; days $340 per mo. with increases up to $400. Rotation from day duty is required only when no person desiring permanent P.M. or night tour is available. Liberal personnel policies include: optional Blue Cross, Discount Hosp. Services, pd. sick leave cumulative to 5 wks., annual physical exam., vacation 1 yr. — 2 wks., 2 yrs. — 3 wks., 5 yrs. — 4 wks. Active in-service pgm. Occasional vacancy hosp. owned apts. New Mexico licensure as professional nurse & U.S. Citizenship (or Immigration Visa) required. Write or call collect: Mrs. Emily J. Tuttle, Dir. of Nursing, Presbyterian Hospital Center, 1012 Gold, S.E., Albuquerque, New Mexico. Phone 243-5611. 15-32-3

Graduate Nurses for 450-bed non-sectarian acute General Hospital with NLN fully accredited school of nursing. Liberal personnel policies include tuition aid for study at Western Reserve University. Opening of new main building has created attractive positions for Staff Nurses in medical, surgical, obstetric and pediatric divisions. Apartments available in immediate neighborhood. Apply: Miss Louise Harrison, Director of Nursing Service, Mount Sinai Hospital, 1800 East 105th Street, Cleveland 6, Ohio. 15-36-1D

Staff Nurses for modern 400-bed tuberculosis hospital, suburban Cleveland, Ohio. Monthly salaries start at $396 with semi-annual increments. Extra for night and relief duty, 5-day work wk., 3-wk. paid vacation, 6 paid holidays, liberal sick leave, comfortable accommodations in nurses' residence at low rate. Learn and earn at a progressive accredited hospital in a growing community. Write: Director of Nursing, Sunny Acres Hospital, Cleveland 22, Ohio. 15-36-1E

Registered Nurse (Scenic Oregon vacation playground, skiing, swimming, boating & cultural events) for 295-bed teaching unit on campus of University of Oregon medical school. Salary starts at $387. Pay differential for nights & evenings. Liberal policy for advancement, vacations, sick leave, holidays. Apply: Multnomah Hospital, Portland 1, Oregon. 15-38-1

STAFF NURSES All Clinical Services. Starting salary $382 for day shift; $419 for evening and night shifts, opportunities for advancement. Personnel policies, sick leave, retirement plan, 3-wk. vacation and laundry of uniforms. Orientation and in-service programs. Housing available on Campus. Apply: Director, Nursing Service, University of Texas Medical Branch Hospitals, Galveston, Texas. 15-44-5

STAFF NURSES University of Washington 320-bed, modern, expanding Teaching and Research Hospital located on campus offers you an opportunity to join the staff in one of the following specialties: Clinical Research, Premature Center, Open Heart Surgery, Physical Medicine, Orthopedics, Neurosurgery, Adult and Child Psychiatry in addition to the General Services. Salary $380 - $442. Unique benefit program offers free University courses after six months fulltime employment. For information on opportunities write to: Mrs. Ruth Fine, Director of Nursing Services, University Hospital, 1959 Pacific Avenue, Seattle, Washington. 15-48-2D

HUMBER MEMORIAL HOSPITAL



HOSPITAL —

Newly expanded 350-bed hospital. Progressive patient care concept.

SALARY —

General Staff Nurses registered in Ontario $335 - $400 per month. Registered Nursing Assistants $235 - $271 per month.

HOUSING —

Furnished apartments available at subsidized rates.

JOB SATISFACTION —

High quality patient care and friendly working environment, personal recognition and professional development.

You are invited to enquire concerning employment opportunities to:

DIRECTOR OF NURSING, HUMBER MEMORIAL HOSPITAL,
200 Church Street, Weston, Ontario - Telephone 249-8111 (Toronto)

THE SCARBOROUGH GENERAL HOSPITAL

A new modern hospital located 10 miles from downtown Toronto invites applications from:

REGISTERED NURSES
REGISTERED NURSING ASSISTANTS

Opportunities are offered in Supervisory, Head Nurse and General Duty positions. Services are offered in Medicine, Surgery, Obstetrics, Pediatrics, Emergency and Intensive Care Units.

Salaries commensurate with prevailing current salaries for Nurses in Metropolitan Toronto and adjustable with experience and educational qualifications.

Progressive Personnel Policies, Pension Plan, Orientation and In-service Program.

For further information write to:

DIRECTOR OF NURSING,
SCARBOROUGH GENERAL HOSPITAL, SCARBOROUGH, ONTARIO.

BERWYN MUNICIPAL HOSPITAL

Requires Registered Nurses for General Duty - Salary $300 to $345 M.S.I.

Apply to:

DIRECTOR OF NURSING
BERWYN MUNICIPAL HOSPITAL - BERWYN, ALBERTA

DIRECTOR OF NURSING, MAY 1, 1964

For 111-bed modern hospital in thriving community on Vancouver Island. Nursing Administration training desirable. Experience essential. Position available May 1, 1964. Salary commensurate with experience and qualifications.

Submit enquiries and application with complete information and references to:

H. E. Taylor, Administrator,
WEST COAST GENERAL HOSPITAL,
Port Alberni, British Columbia.

PUBLIC HEALTH NURSES

REQUIRED FOR HEALTH BRANCH, B.C. CIVIL SERVICE

Positions available for qualified Public Health Nurses in various centres in British Columbia. SALARY: $375 - $462 per month; car provided. An opportunity for interesting and challenging professional service in this beautiful and fast-developing Province. For further information and application forms, apply to The Director, Public Health Nursing, Department of Health Services and Hospital Insurance, Parliament Buildings, Victoria, B.C., or to The Chairman, B.C. Civil Service Commission, 544 Michigan Street, Victoria, B.C.

COMPETITION No. 64:1

ASSISTANT DIRECTOR OF NURSING SERVICE

Wanted for McKellar General Hospital. An active treatment hospital of 380 beds, with a progressive school of nursing. Postgraduate preparation essential; Baccalaureate Degree preferred.

APPLY TO:

Director of Nursing,
McKELLAR GENERAL HOSPITAL,
Fort William, Ontario.

REGISTERED NURSES REQUIRED

For General Duty in modern 18-bed private Hospital in iron mining town, 140 miles north of Sault Ste. Marie, Ontario.

SALARY RANGE $320 MINIMUM TO $360 MAXIMUM

Allowance for experience. Board and room available at $20 per month. Transportation allowance up to $50 after 6 months.

Apply:

SUPERINTENDENT OF NURSES, LADY DUNN HOSPITAL, WAWA, ONTARIO.

SUPERVISORS

FOR

Inservice Education Department

AND

Operating Room

Required by an active 250-bed hospital.

Apply to:

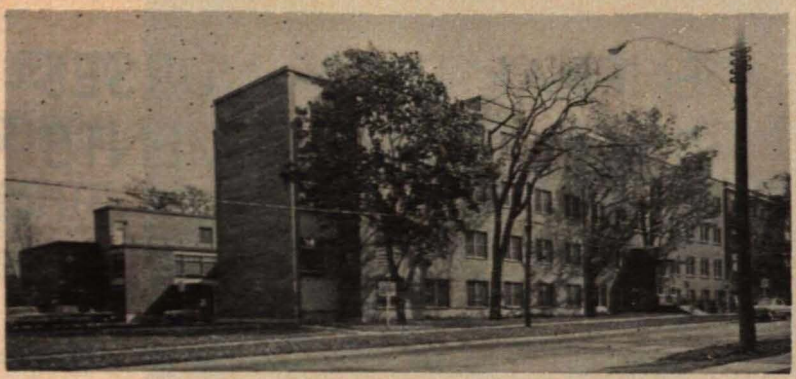
Director of Nursing,
NORTHWESTERN GENERAL HOSPITAL,
2175 Keele Street, Toronto 15, Ontario.

REGISTERED NURSES

Registered Nurse required to take charge of a fifteen bed Chronic Hospital. Salary $350 per month with accommodation available. Increases at six months and one year. Forty hour week.

Apply to:

Secretary,
PONTIAC COMMUNITY HOSPITAL,
Shawville, Quebec.



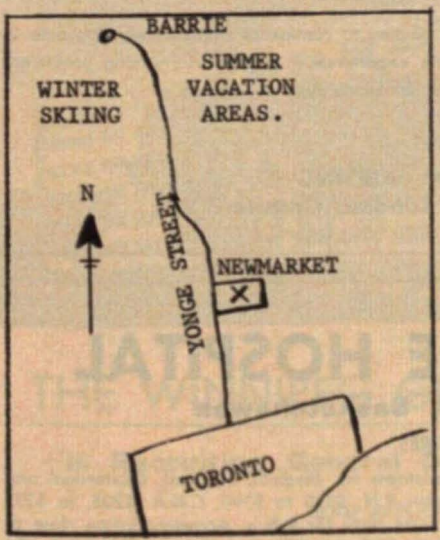
ASSISTANT DIRECTOR OF NURSING (EDUCATION)

Required for 75-student School of Nursing in this 250-bed accredited hospital in the Seaway Valley. University preparation required. Good personnel policies including four weeks' vacation, nine statutory holidays, pension plan, group insurance, etc.

Apply to:

ADMINISTRATOR,
CORNWALL GENERAL HOSPITAL, CORNWALL, ONTARIO.

YORK COUNTY HOSPITAL



ONE HOUR FROM DOWNTOWN TORONTO

260 bed Hospital with new facilities including:

INTENSIVE CARE UNIT
SELF CARE UNIT
PSYCHIATRIC UNIT

REGISTERED NURSES: $335-$400 per month.

REGISTERED NURSING ASSISTANTS: $230-$265 per month.

LIBERAL PERSONNEL BENEFITS INCLUDE:

Pension Plan, Group Life Insurance,
Medical and Hospital Insurance.
Residence accommodation available.

Please write for further details concerning employment opportunities to:

DIRECTOR OF NURSING, YORK COUNTY HOSPITAL,
Newmarket, Ontario.

GENERAL DUTY NURSES FOR ALL DEPARTMENTS

Gross salary for nurses registered in the Province of Ontario $335 monthly with annual increment $10 monthly to $385.

Salary until registration is established — $305 monthly.

Rotating periods of duty — 40 hour week, 8 statutory holidays annually — Annual vacation 21 days.

Annual sick time 12 days after one year, unused portion cumulative to 36 days.

Hospitals of Ontario Pension Plan.

Ontario Hospital Insurance and Physicians' Services Incorporated, 50% payment by hospital.

Apply:

DIRECTOR OF NURSING, GENERAL HOSPITAL, OSHAWA, ONTARIO

VICTORIA HOSPITAL

London, Ontario

HEAD NURSE for fifty-bed (50) Psychiatric Unit. Duties to commence immediately. Diploma in Nursing Service Administration and postgraduate experience in psychiatric nursing preferred. Salary commensurate with qualifications and experience.

Apply:

DIRECTOR OF NURSING
Victoria Hospital, London, Ontario

NOTRE DAME HOSPITAL

North Battleford, Saskatchewan

REQUIRES

General Staff Nurses and Certified Nursing Assistants for Medical, Surgical, Obstetrical and Pediatric Services. Forty hour week. Salary range: R.N. $315 to $390, C.N.A. $205. to $235 gross per month. Differential for evening and night duty for R.N.'s. Accommodation close to hospital if desired.

Apply to:

DIRECTOR OF NURSING SERVICE,
Notre Dame Hospital, North Battleford, Sask.

JEWISH GENERAL HOSPITAL MONTREAL QUE.

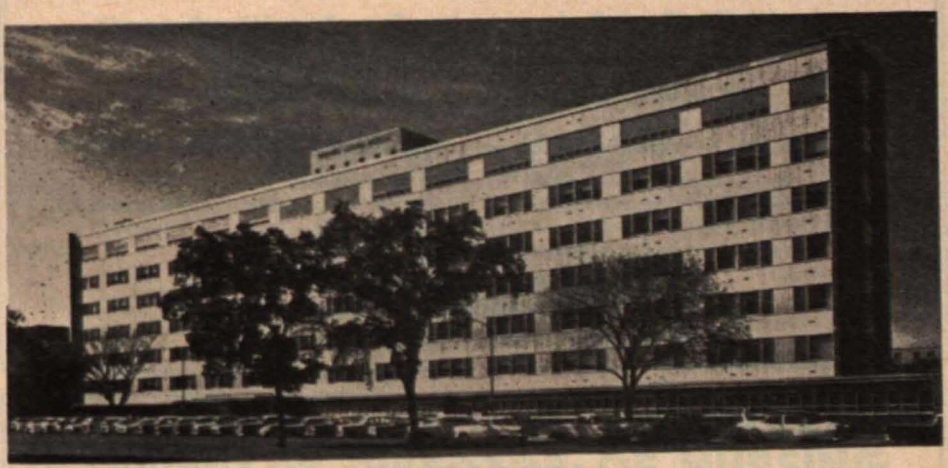


NURSING OPPORTUNITIES

In this modern 400-bed non sectarian hospital in Administration, Teaching, Staff Nursing, Certified Nursing Assistants also required. Openings in Psychiatry, Pediatrics, Obstetrics and Medicine and Surgery. Excellent personnel policies. Bursaries for post-basic courses in Teaching and Administration.

For further information, please write:

Director of Nursing, JEWISH GENERAL HOSPITAL, 3755 Cote St. Catherine Rd., Montreal, Que.



THE WINNIPEG GENERAL HOSPITAL

is Recruiting General Duty Nurses for all Services

SEND APPLICATIONS DIRECTLY TO

THE PERSONNEL DIRECTOR, WINNIPEG GENERAL HOSPITAL, WINNIPEG 3, MANITOBA.

ONTARIO PROVINCIAL GOVERNMENT

DEPARTMENT OF HEALTH REQUIRES

PUBLIC HEALTH NURSES

FOR

NORTHERN ONTARIO PUBLIC HEALTH SERVICE

Starting salary — $4,400 (with experience)

—To develop and organize an expanding public health nursing service in outlaying areas.
—Challenging opportunity for person with initiative in developing and co-ordinating programs.
—Bilingualism an asset but not essential.
—Excellent promotional opportunity.
—Full range of employee benefits.
—Services established in North Bay and Timmins. Plans for additional offices in Sault Ste. Marie, Sudbury, Lakehead.

Apply to:

Personnel Director,
Room 5527 East Block, Parliament Buildings, Toronto.

DIRECTOR, SCHOOL OF NURSING

SOUTHWESTERN ONTARIO RESORT AREA

Excellent position available in Spring of 1964. Modern classrooms and facilities in main wing of 351-bed hospital. Student enrollment of 95. Modern students' residence adjacent to hospital. Minimum qualifications include a bachelor's degree in Nursing Education, as well as successful experience in Nursing Administration and Education. Registration in Ontario is required. The person appointed to this position will have the opportunity of using progressive techniques in teaching.

Write to:

Administration,
SARNIA GENERAL HOSPITAL,
Sarnia, Ontario.

CLINICAL INSTRUCTORS

ST. JOSEPH'S HOSPITAL, SCHOOL OF NURSING,
Hamilton, Ontario.

MEDICAL — SURGICAL — and OBSTETRICAL UNITS

Well-equipped modern school of nursing — Expanded January, 1963.
800 Bed Hospital fully accredited. Salary commensurate with preparation and experience.

For further information please apply to:

DIRECTOR OF NURSING,
ST. JOSEPH'S HOSPITAL,
School of Nursing, Hamilton, Ontario.

OAKVILLE-TRAFALGAR MEMORIAL HOSPITAL

OAKVILLE, ONTARIO

General Duty Nurses for all departments, also Operating Room Nurses required in modern 340-bed fully accredited hospital.
Oakville is a progressive community situated on Lake Ontario just twenty miles from the cities of Toronto and Hamilton. Excellent salaries and personnel policies. Further details will be furnished on request.

Apply to:

DIRECTOR OF NURSING,
Oakville-Trafalgar Memorial Hospital,
Oakville, Ontario.

GUELPH GENERAL HOSPITAL

Active — 200 Beds — Fully Accredited

requires

FOR SEPTEMBER 1964:

OPERATING ROOM SUPERVISOR

INSTRUCTOR FOR OPERATING ROOM

SCIENCE INSTRUCTOR

GENERAL STAFF NURSES

REGISTERED NURSING ASSISTANTS

Pleasant City of 38,000. One hour from Toronto via 401. Good Personnel Policies.

For further details apply to:

THE DIRECTOR OF NURSING,
General Hospital,
Guelph, Ontario.

PORT COLBORNE GENERAL HOSPITAL

PORT COLBORNE, ONTARIO.

requires

REGISTERED NURSES

For recently expanded General Hospital of 166 beds within easy driving distance of American and Canadian metropolitan centres. Salary $335 per month with five annual increments of $120 per year. Consideration given for previous experience obtained in Canada. Vacancies in all departments.

Apply:

DIRECTOR OF NURSING,
General Hospital,
Port Colborne, Ontario.

Opportunities for Employment Are Available in:

SCHOOL OF NURSING:

CLASSROOM INSTRUCTOR — CLINICAL INSTRUCTORS FOR:
Operating Room, Medicine, Neurosurgery, Pediatrics, Psychiatry.

NURSING SERVICE:

SUPERVISOR, DEPARTMENT OF PEDIATRICS — STAFF NURSES, MEDICINE AND SURGERY.
University teaching hospital. Applicants should be eligible for Ontario Registration.

Personnel policies and further information may be obtained from:

Director of Nursing,
KINGSTON GENERAL HOSPITAL,
Kingston, Ontario.

ASSISTANT DIRECTOR OF NURSING

Required for

ROYAL OTTAWA SANATORIUM

WHICH HAS A NEW PSYCHIATRIC UNIT

Apply to:

DIRECTOR OF NURSING,

Royal Ottawa Sanatorium, Ottawa, Ontario.

CLINICAL INSTRUCTORS

Required for School of Nursing in this 350-bed General Hospital. Modern classrooms and facilities. Student enrollment 95.

Minimum qualifications — Diploma in Nursing Education. Good starting salary with special consideration for experience or degree.

Excellent working conditions with opportunities to use progressive techniques in teaching.

Apply:

Personnel Director,
SARNIA GENERAL HOSPITAL,
Sarnia, Ontario.

MATRON and HOSPITAL SUPERINTENDENT

Required for modern 32-bed industrial hospital located in a modern rapidly-expanding northern Manitoba mining community.

—Postgraduate education desirable.
—Operating room experience preferable, but not essential.
—Administrative ability essential.
—Attractive starting salary, pleasant working conditions.
—Liberal employee benefits.

Interested applicants please apply in writing, stating age, education and experience to:

THE INTERNATIONAL NICKEL COMPANY OF CANADA, LIMITED,
Thompson, Manitoba.
Attention: Superintendent-Personnel

HOSPITAL NURSES

Hospital Nurses required (by April 1st) for Churchill General Hospital, Churchill, Manitoba. Starting salary up to $4,350 per annum plus $720 a year isolation allowance. Additional allowances for post graduate training — Accommodation available, good fringe benefits.

Apply to Regional Superintendent, Medical Services, Central Region, Department of National Health and Welfare, 705 Commercial Building, 169 Pioneer Avenue, Winnipeg, Manitoba.

DIRECTOR OF NURSING

FOR MODERN, 163-BED, FULLY ACCREDITED GENERAL HOSPITAL.
SALARY COMMENSURATE WITH QUALIFICATIONS AND EXPERIENCE.

Please address enquiries to:

Administrator,
KIRKLAND AND DISTRICT HOSPITAL,
Kirkland Lake, Ontario.

SCHOOL OF NURSING

METROPOLITAN GENERAL HOSPITAL

requires

INSTRUCTOR IN PSYCHIATRIC NURSING

This is an opportunity to participate in the development of a progressive program which emphasizes educational nursing experience for the student. The program consists of 2 basic, preparatory years followed by one year of Nursing Internship. One class of 32 students is admitted annually. **Duties include:** Instruction in Introductory Psychology and Mental Hygiene. Clinical and Classroom Instruction in Psychiatric Nursing. **Requirements:** University preparation in Nursing Education. — Salary differential for Degree. — Duties to commence August, 1964.

For further information, contact:

Director, School of Nursing, 2240 Kildare Road, Windsor, Ontario

ST. JOSEPH'S HOSPITAL, GUELPH, ONTARIO

Offers challenging position in Progressive Curriculum to:

3 INSTRUCTORS (Classroom and Clinical)

80 Students enrolled in School

(Within 50 miles radius of Toronto and Hamilton)

Salary commensurate with experience and education

Contact:

DIRECTOR OF NURSING

ASSOCIATE DIRECTOR OF NURSING SERVICE

General Hospital of 280 beds located in a progressive and friendly city in sunny southern Alberta. Population 27,000. School of Nursing with a maximum enrollment of 90 Students. Excellent personnel policies including coverage for hospitalization, medical services and a pension plan. Salary based on education and experience.

Write to:

Director of Nursing,
MEDICINE HAT GENERAL HOSPITAL,
Medicine Hat, Alberta.

GRADUATE STAFF NURSES

Opportunities for men and women on all services including metabolism, rehabilitation, psychiatry, recovery room, medicine, surgery, pediatrics, obstetrics, operating room and emergency room. Well planned orientation and in-service programs, tuition free courses at Western Reserve University after 3 months employment, low cost housing in nurses' residence. Liberal personnel policies with premiums for evening and night tours. Staff Nurse salaries range $400-$440, based on experience and education. For more information ask for our new booklet describing nursing opportunities at University Hospitals.

Write to:

THE DIRECTOR OF NURSING, UNIVERSITY HOSPITALS OF CLEVELAND,
University Circle, Cleveland, Ohio, 44106.

ST. JOSEPH'S HOSPITAL

Hamilton, Ontario

A modern, progressive, 850-bed hospital, located in the centre of Ontario's Golden Horseshoe, has openings for:

1) **Head Nurses for Medical or Surgical units.**

 Postgraduate study preferred.

2) **General Staff Nurses in all clinical areas.**

3) **Registered Nursing Assistants in all clinical areas.**

For further information write to:

THE DIRECTOR OF NURSING,
St. Joseph's Hospital,
Hamilton, Ontario.

REGISTERED NURSES
and
REGISTERED NURSING ASSISTANTS

required for

FIVE SUMMER CAMPS

STRATEGICALLY LOCATED
THROUGHOUT ONTARIO
AND NEAR
OTTAWA - LONDON
COLLINGWOOD
PORT COLBORNE
KIRKLAND LAKE

PREFERENCE GIVEN TO APPLICANTS WITH PEDIATRIC EXPERIENCE.

Apply in writing to:

MISS HELEN WALLACE, REG'D.N.
Supervisor of Camps
ONTARIO SOCIETY FOR CRIPPLED CHILDREN
350 Rumsey Road
P.O. Box 1700, Station "R"
Toronto 17, Ontario.

REGISTERED NURSES
and
CERTIFIED NURSING ASSISTANTS

for

360-bed accredited General Hospital. Registered Nurses salary range $315-$355 per month with consideration for contemporary experience or special preparation.

Certified Nursing Assistants $210 - $240 per month.

For further information write:

Director of Nursing Service
METROPOLITAN GENERAL HOSPITAL
Windsor, Ontario.

VICTORIA HOSPITAL

LONDON, ONTARIO

Modern 1000-bed hospital

requires

Registered Nurses for all services

and

Registered Nursing Assistants

40 hour week - Pension plan
Good salaries and Personnel Policies.

Apply:

DIRECTOR OF NURSING,
VICTORIA HOSPITAL, LONDON, ONT.

DIRECTOR OF NURSING.

REQUIRED BY JUNE 1st, 1964

For modern 18 bed, 8 bassinet hospital, serving a progressive, fast growing farming and industrial area in Northern Alberta. Salary open for discussion, depending on experience. Employees participate in Pension Plan, M.S.I. and Blue Cross.
Matron suite in NEW Nurses' Residence available at $35 per month, including board and laundry. Fare will be paid from any point in Canada, on condition of at least one year employment.
Please state in application, date available, salary expected and experience.

For further information write, phone or wire collect to:

MANNING MUNICIPAL HOSPITAL,
Box 250, Manning, Alberta, Ph. 173, after hours 189 or 236.

ASSOCIATE DIRECTOR OF NURSING EDUCATION

Required for three year diploma School of Nursing associated with a modern 163-bed General Hospital. Present enrollment of 60 students with view to increasing enrollment to 90 students. Construction of new School and Residence to commence in 1964. Postgraduate preparation essential, Baccalaureate Degree preferred. Salary commensurate with experience and preparation.

Apply to:

Director of Nursing,
YARMOUTH REGIONAL HOSPITAL,
Yarmouth, Nova Scotia.

THE MARGARET COCHENOUR MEMORIAL HOSPITAL

COCHENOUR, ONTARIO

Invites applications for the position of

MATRON, FOR MARCH, 1964

28 bed active General Hospital located in gold mining tourist area with three small towns close by. Accessible by road, bus and plane. Winter, summer sports, shops, shows etc., available in area. Private suite in residence. Full maintenance $45 monthly. Twenty-eight days vacation after each year's employment. Applicant to handle general administration of the hospital. Salary range up to $450 monthly.

Please forward full information as to age, marital status etc., nursing qualifications, registration, previous experience etc. to:

MR. W. R. B. TROW, AT BALMERTOWN, ONTARIO.

YORK CENTRAL HOSPITAL

RICHMOND HILL, ONTARIO
Applications are invited for:

1) General Staff Nursing Positions.
2) Registered Nursing Assistant Positions.
ALL in Clinical Areas.

This is a new 126-bed active treatment hospital, lying outside Metropolitan Toronto, Progressive personnel policies, salary based on education and experience.

Apply to:

DIRECTOR OF NURSING,
York Central Hospital, Richmond Hill, Ontario.

GENERAL STAFF NURSE POSITIONS

AVAILABLE

In the General Operating Rooms (includes general surgery, cardiac, neurosurgery, plastic, ear, nose and throat and urology), Gynecological and Ophthalmological operating rooms. Salary commensurate with experience. Opportunities for promotion. Excellent fringe benefits including refund of tuition up to six points per semester.

For further information write:

Director, Nursing Service,
THE JOHN'S HOPKINS HOSPITAL
Baltimore 5, Maryland.

NURSES

KENORA, ONTARIO

This resort town of 14,000 people has just opened a section of its new 100-bed hospital and in the not too distant future will be opening the second section for which nurses are needed. The hospital is wonderfully located on the shores of beautiful Lake of the Woods in Ontario. In the summer we have activities in swimming, boating, fishing and golfing and in the winter there is skating, curling, tobogganing, skiing and ice fishing.

A nurse's residence is available at a reasonable rate of $20 per month for private room or $15 per month for a double room. Cafeteria services are available at cost as well as a kitchen in the nurses' residence. Separate personnel policies for nurses are available and will be mailed on request. The starting salary is $330 per month. Eight statutory holidays, sick leave, three weeks vacation with pay are some of the benefits of these policies.

All applications will be treated with courtesy and privacy.

Please apply to:

Director of Nursing,
KENORA GENERAL HOSPITAL,
Kenora, Ontario.

SOUTH PEEL HOSPITAL

COOKSVILLE

A new 450-bed General Hospital, located 12 miles from the City of Toronto, has openings for:

(1) Supervisor for Nursing Office with Nursing Service Administration Diploma.

(2) Supervisor for Unit Administration on Medical Ward.

(3) Head Nurses and Assistant Head Nurses for Medical and Surgical units.

(4) General Staff Nurses in all departments.

Good personnel policies. Salary commensurate with experience and preparation.

For information or application, write to:

DIRECTOR OF NURSING
South Peel Hospital,
Cooksville, Ontario

APPLICATIONS ARE INVITED FOR THE POSITION OF

DIRECTOR OF NURSING SERVICE

AT

THE METROPOLITAN GENERAL HOSPITAL

WINDSOR, ONTARIO.

The Metropolitan General Hospital is a fully accredited 362 bed facility, and applicants with experience and holding a Bachelor Degree, or with University preparation, will be given preferable consideration. Associated with the Hospital is the Metropolitan Hospital School of Nursing which has teaching standards well recognized in Ontario.
Salary will be commensurate with qualifications and experience, and other employee benefits are generous.

Address all applications and enquiries to:

THE ADMINISTRATOR,
METROPOLITAN GENERAL HOSPITAL,
1995 Lens Ave., Windsor, Ont.

OSHAWA GENERAL HOSPITAL

Oshawa, Ontario

Requires for School of Nursing

CLINICAL INSTRUCTOR IN SURGICAL NURSING

with Certificate in Nursing Education

For further information, apply to:

DIRECTOR OF NURSING,
Oshawa General Hospital, Oshawa, Ontario.

GENERAL DUTY NURSES

SALARY RANGE $327 - $362

Required by Metropolitan Toronto for the new Riverdale Hospital, an 800-bed hospital for chronic and convalescent patients. Shift allowances for afternoon and night shifts. Cumulative sick pay and pension plans are in effect. Permanent positions, 40 hour week.

Apply:

PERSONNEL OFFICE,
387 Bloor Street East, Toronto 5, Ontario.

UNIVERSITY HOSPITAL

Saskatoon, Saskatchewan

APPLICATIONS ARE INVITED FOR:
General Staff positions.

OPPORTUNITIES FOR EMPLOYMENT ARE AVAILABLE IN:
Medical, Surgical, Obstetrical, Pediatric, Psychiatric and Rehabilitation Services.

SALARY RANGE:
$300-$360 — Differential for evening and night duty — 40-hour week.

RESIDENCE:
Temporary accommodation if desired.

Apply to:

DIRECTOR OF PERSONNEL, UNIVERSITY HOSPITAL,
Saskatoon, Saskatchewan.

DIRECTOR, SCHOOL OF NURSING

For three year diploma school. Maximum enrollment of 90 students. School is a part of a busy General Hospital of 280 beds in a progressive friendly city located in sunny southern Alberta. Population approximately 27,000. Position created by a change in organization pattern establishing separate administrations for education and service. Excellent personnel policies including a pension plan. Salary based on education and experience.

Write to:

The Administrator,
MEDICINE HAT GENERAL HOSPITAL,
Medicine Hat, Alberta.

DIRECTOR OF NURSING SERVICE

for the

St. Boniface General Hospital, (715 beds)

University Degree, preferably Master's and experience at an advanced level required.

Please apply, stating full particulars, to:

Personnel Director,
ST. BONIFACE GENERAL HOSPITAL,
St. Boniface, Manitoba.

VICTORIAN ORDER OF NURSES

FOR CANADA

OFFERS CAREER OPPORTUNITIES FOR

PUBLIC HEALTH NURSES

Staff and supervisory positions are available in various parts of Canada. Good personnel policies. Pension plan. Uniform allowance. Transportation on duty.

Apply to:

MISS JEAN LEASK,
Director in Chief,
5 Blackburn Avenue,
Ottawa 2, Ontario.

GENERAL DUTY NURSES

for Chest Hospital in centre of Montreal. Salary according to ANPQ recommendations. Differential for evening and night duty.

Apply:

Director of Nursing,
ROYAL EDWARD LAURENTIAN HOSPITAL,
3650 St. Urbain Street,
Montreal 18, Quebec.

THE GRENFELL MISSION

Has excellent opportunities for interesting and challenging work in northern Newfoundland and the Labrador coast.

For details, please write:

Miss Dorothy A. Plant, Secretary,
GRENFELL LABRADOR MEDICAL MISSION,
Room 701A, 88 Metcalfe Street,
Ottawa 4, Ontario.

INSTRUCTORS NEEDED

As the number of Students increases, so must the number of Instructors! Our Junior Students attend Lakehead College for 5 subjects during the academic year.

The School is progressive and the program is dynamic!

Apply to:

Director of Nursing,
McKELLAR GENERAL HOSPITAL,
Fort William, Ontario.

ROYAL INLAND HOSPITAL

KAMLOOPS, BRITISH COLUMBIA

The School of Nursing of the Royal Inland Hospital invites applications for the position of:

CLINICAL INSTRUCTOR (Surgical)

New residence and teaching facilities opening early in 1964. Expected student enrolment — 100. Position available after May 1st, 1964.

For further information, apply to:

DIRECTOR OF NURSING

REGISTERED NURSES REQUIRED

For the Operating Room and other Services. Good personnel policies. Residence accommodation available — $30 per month. 'A Friendly Hospital in a Friendly Community'.

For further information, write to:

Director of Nursing,
McKELLAR GENERAL HOSPITAL,
Fort William, Ontario.

CAMP DIRECTORS

Registered Nurses to direct summer camps for crippled children — June, July, August. Preference given to applicants with supervisory experience.

For further information, apply to:

SUPERVISOR OF CAMPS,
Ontario Society for Crippled Children,
Box 1700, Postal Station "R",
350 Rumsey Road, Toronto 17,
Ontario.

GENERAL STAFF NURSES

SALARY $380 to $425

(Commensurate w/experience)

$3.00 per day differential for evenings. $1.50 differential for nights. Positions available in Birthroom, Post Partum, Newborn Nursery and Medical - Surgical areas. Time and a half for overtime. Quarters available on hospital grounds. Other liberal fringe benefits.

For more information write:

Personnel Director,
WOMAN'S HOSPITAL,
432 E. Hancock, Detroit 1, Michigan.
TEmple 3-2000

ASSISTANT DIRECTOR OF NURSING

(NURSING SERVICE)

for

New 220 bed General Hospital.
Preparation and experience required.

For further information apply to:

Director of Nursing,
BRANDON GENERAL HOSPITAL,
Brandon, Manitoba.

QUEEN ELIZABETH HOSPITAL

OF MONTREAL

Positions available for Registered Nurses, general duty in a recently enlarged and modernized 273-bed General Hospital in residential area. Progressive Patient Care currently in effect with intensive intermediate and self-care units established. Positions available also in Obstetrical Department. Salaries and policies are in accordance with the recommendations of the Association of Nurses of the Province of Quebec. Differential paid for permanent evening and night duty. For further information, please make appointment or write to:

DIRECTOR OF NURSING,
Queen Elizabeth Hospital of Montreal,
2100 Marlowe Ave., Montreal 28, Que.

INSERVICE EDUCATION SUPERVISOR

To organize and initiate an Inservice Education Program for an Acute General Hospital with School of Nursing, situated in the Interior of British Columbia. Large construction project in progress at the present time.

Interested applicants are invited to apply to:

DIRECTOR OF NURSING,
ROYAL INLAND HOSPITAL,
Kamloops, British Columbia.

REGISTERED NURSES

required for:

82-bed hospital. Situated in the Niagara Peninsula. Transportation assistance.

For salary rates and personnel policies, apply to:

DIRECTOR OF NURSING,
Haldimand War Memorial Hospital,
Dunnville, Ontario.

REGISTERED NURSE

to

110-bed "HOME FOR THE AGED" with 50-bed bed-care wing. Located on Grand River, Niagara Peninsula within 1 hour's travel to Hamilton, Niagara Falls and Buffalo, N.Y. Modern staff quarters optional.

For full particulars apply:

SUPERINTENDENT

stating qualifications, experience and remuneration:

GRANDVIEW LODGE
Dunnville, Ontario

NEW OPPORTUNITIES AT EXPANDING U.S. HOSPITAL

Conscientious, qualified nurses will find a world of opportunity at the Stamford Hospital. Responsible staff positions are being created in every service. Here, in the friendly, progressive atmosphere of "Research City", you will find many extra hospital and community benefits.

- Choice of services
- Advancement opportunities
- Educational assistance program
- Ample recreational facilities including beaches, golf, tennis
- Accessibility to New York City's theaters, concert halls, 1964-65 World's Fair
- Modern housing available
- Health benefits and retirement program
- Salary commensurate with experience and ability
- Travel allowance

Recent registration in most Provinces acceptable when applying for Connecticut registration by reciprocity.

Write for information:

MISS BEATRICE STANLEY, R.N.
DIRECTOR OF NURSING,
THE STAMFORD HOSPITAL
STAMFORD, CONNECTICUT

NOVA SCOTIA SANATORIUM

KENTVILLE, N.S.

Offers to Graduate Nurses a Three-Month Course in *Tuberculosis Nursing*, including Immunology, Prevention, Medical and Surgical Treatment.

1. Full series of lectures by Medical and Surgical staff.
2. Demonstrations and Clinics.
3. Full maintenance, salary and all staff privileges.

For information apply to:

DIRECTOR OF NURSING,
NOVA SCOTIA SANATORIUM,
Kentville, N.S.

GENERAL DUTY NURSES

required for

MEDICAL — SURGICAL — PEDIATRIC
Departments

in a 140-bed modern hospital. Excellent employee benefits program. Good personnel policies.

Address replies to:

Personnel Director,
ROSS MEMORIAL HOSPITAL,
Lindsay, Ontario.

CHILDREN'S HOSPITAL OF WASHINGTON, D.C.

OFFERS

Registered Nurses a 16-wk. supplementary program in pediatric nursing. Admission dates, **January 6, May 4, and August 31, 1964.**

For complete information write to:

DIRECTOR OF NURSING,
2125-13th Street, N.W.,
Washington, 9, D.C.

DIRECTOR OF NURSING

For modern, fully accredited 101-bed hospital expanding to 200 beds. University preparation and considerable previous experience in senior administrative positions desirable. Salary commensurate with qualifications and experience. Excellent personnel policies.

Apply with full particulars to:

Administrator,
NORTH BAY CIVIC HOSPITAL,
North Bay, Ontario.

CAMP HIAWATHA

4 miles from Ste. Agathe
125 Boys (2 Separate Camps) 125 Girls
Requires two (2) Registered Nurses for the months of July and August, 1964. Our 33rd year.

Please Apply to:

B. JACOBSON,
1640 St. Clare Road,
Town of Mount Royal.—RE. 7-3807
"We are willing to accept 4 Nurses, each for one month, if necessary."

EDUCATIONAL OPPORTUNITIES

DALHOUSIE UNIVERSITY

School of Nursing

Degree Course in Basic Professional Nursing

Candidates for the degree of Bachelor of Nursing are required to complete 2 years of university work before entering the clinical field, and one year of university work following the basic clinical period of 30 months. On completion of the course the student receives the **Degree** of Bachelor of Nursing and the **Professional Diploma** in either Teaching in Schools of Nursing or Public Health Nursing.

Degree Course for Graduate Nurses

Graduate nurses who wish to obtain the degree of Bachelor of Nursing are required to complete the three years of university work.

Diploma Courses for Graduate Nurses

(a) Public Health Nursing
(b) Teaching in Schools of Nursing
(c) Nursing Service Administration

For further information apply to.

DIRECTOR, SCHOOL OF NURSING
DALHOUSIE UNIVERSITY, HALIFAX, N.S.

THE UNIVERSITY OF WESTERN ONTARIO

SCHOOL OF NURSING

LONDON, ONTARIO

Announces the Second

SCHOOL FOR SENIOR NURSING EXECUTIVES

to be held June 22 to July 4, 1964.

The program is planned to assist nursing personnel functionning in senior executive and consultant positions:

- Directors of nursing service
- Assistants and supervisors in hospitals and health agencies
- Directors and assistants of nursing education
- Executives and consultants of professional organizations
- Executives and consultants of government departments

FEE $200.00

For further information about this program and applications write to:

THE SCHOOL OF NURSING.

QUEEN'S UNIVERSITY

SCHOOL OF NURSING

COURSES OFFERED

Undergraduate

Degree Course, B.N.Sc.,

Graduate Nurse

(a) Degree Course, two years.

(b) Diploma Courses, one year.
Public Health Nursing
or
Teaching and Supervision.

Entrance requirement for all courses: Senior Matriculation

For information apply to:

DIRECTOR
SCHOOL OF NURSING
QUEEN'S UNIVERSITY
KINGSTON, ONTARIO

UNIVERSITY OF BRITISH COLUMBIA

School of Nursing

DEGREE COURSE IN BASIC NURSING

DEGREE COURSE FOR GRADUATE NURSES

Both of these courses lead to the B.S.N. degree. Graduates are prepared for public health as well as hospital nursing positions.

DIPLOMA COURSES FOR GRADUATE NURSES

1. **Public Health Nursing.**
2. **Administration of Hospital Nursing Units.**

For information write to:

The Director,
SCHOOL OF NURSING,
UNIVERSITY OF B.C.,
VANCOUVER 8, B.C.

ST. JOSEPH'S HOSPITAL

TORONTO, ONTARIO

Offers a 6 month Postgraduate Course in Operating Room Management and Technique.

Classes March and September.

— Reasonable monthly stipend —

For information and details of the Course, apply to:

DIRECTOR OF NURSING SERVICE,
St. Joseph's Hospital,
30 The Queensway,
Toronto 3, Ontario.

WILLS EYE HOSPITAL

Philadelphia, Penna.

The largest eye hospital in the United States offers a six-month course in *Nursing care of the Eye* to *Graduates of Accredited Nursing Schools*. Operating Room Training is scheduled in the course.

- **Full maintenance and a stipend of $237 per month for the first three months, $247 per month for the last three months, plus maintenance.**
- ***Registration Fee is* $20.**
- **Course starts *September 16th & March 16th*. Ophthalmic Nurses in great demand for hospital eye departments, operating rooms & ophthalmologist's offices.**

For information write to:

Director of Nurses,
WILLS EYE HOSPITAL,
1601 Spring Garden Street,
Philadelphia 30, Penna.



SCHOOL FOR GRADUATE NURSES
McGILL UNIVERSITY

PROGRAMS FOR GRADUATE NURSES

DIPLOMA

Students are granted a diploma at the completion of the first year of the program leading to the degree of Bachelor of Nursing. All first-year students elect to study in

PUBLIC HEALTH NURSING

or

TEACHING AND SUPERVISION IN ONE OF THE FOLLOWING:

- Medical-Surgical Nursing
- Psychiatric Nursing
- Maternal and Child Health Nursing

DEGREE OF BACHELOR OF NURSING

A two-year program for nurses with McGill Senior Matriculation or its equivalent.

A three-year program for nurses with McGill Junior Matriculation or its equivalent. In the first year students elect a field as indicated above. In the final year students elect to major in one of the following:

- Nursing Education
- Administration and Supervision in Hospitals or in Public Health Agencies

DEGREE OF MASTER OF SCIENCE (APPLIED)

A program of approximately two years for nurses with a baccalaureate degree. Students elect to major in

- Development and Administration of Educational Programs in Nursing
- Nursing Service Administration in Hospitals and Public Health Agencies

PROGRAM IN BASIC NURSING

leading to the degree Bachelor of Science in Nursing

A five-year program for students with McGill Junior Matriculation or its equivalent. This program combines academic and professional courses with supervised nursing experience in the McGill teaching hospitals and selected health agencies. This broad background of education, followed by graduate professional experience, prepares nurses for advanced levels of service in hospitals and community.

For further information write to:

DIRECTOR, McGILL SCHOOL FOR GRADUATE NURSES

3506 UNIVERSITY STREET, MONTREAL 2, QUE.

AN EXTENSION COURSE IN NURSING UNIT ADMINISTRATION

Those nurses who are interested in enrolling for the Extension Course in Nursing Unit Administration should submit their applications not later than May 31st, 1964. Applications will be accepted from nurses who are engaged in positions of assistant head nurses, head nurses or supervisors and who are unable to attend a university school of nursing. Directors of nurses in small hospitals may also enroll.

The course will start with a five-day workshop in September to be followed by a seven month period of home study. A final five-day workshop will be held in May 1965.

This course is jointly sponsored by the Canadian Nurses' Association and the Canadian Hospital Association.

Information and application forms may be obtained by writing to:

DIRECTOR, EXTENSION COURSE IN NURSING UNIT ADMINISTRATION,
25 IMPERIAL STREET, TORONTO 7, ONTARIO.

CLINICAL COURSE IN PSYCHIATRIC NURSING

offered by

THE MENTAL HEALTH SERVICES, BRITISH COLUMBIA

to

NURSES ELIGIBLE FOR B.C. REGISTRATION

- Admission: February and October
- Six month program of instruction and practice
- Reasonable monthly stipend
- Room and Meals at nominal rates

For further information please write to:

ASSOCIATE DIRECTOR, DEPARTMENT OF NURSING EDUCATION,
ESSONDALE, B.C.

MONTREAL CHILDREN'S HOSPITAL

Offers a 6 month postgraduate course in Nursing of Children

ENTRANCE DATES SEPTEMBER AND MARCH

This course is designed for, **Registered Nurses** with a minimum of 1 year's experience in Pediatric Nursing.

Apply to:

DIRECTOR OF NURSING,
Montreal Children's Hospital,
2300 Tupper Street, Montreal 25, Quebec.

McMASTER UNIVERSITY

DEGREE COURSE IN BASIC NURSING (B.Sc.N.)

A Four-Year Course which prepares students for all branches of community and hospital nursing practice and leads to the degree, Bachelor of Science in Nursing (B.Sc.N.). It includes studies in the humanities, basic sciences and nursing. Bursaries, loans and scholarships are available.

For additional information, write to:

SCHOOL OF NURSING,
McMASTER UNIVERSITY, HAMILTON, ONTARIO.

A COURSE

in Advanced Operating Room Technique and Management

is offered by

THE MONTREAL GENERAL HOSPITAL

to

Qualified Registered Nurses

Classes of 6 months' duration are admitted March and September and are limited to 8 students.

For further information write to:

THE DIRECTOR OF NURSING,
The Montreal General Hospital,
Montreal 25, Quebec.

THE WINNIPEG GENERAL HOSPITAL

Offers the following opportunity for advanced preparation to qualified Registered Graduate Nurses:

A six month Clinical Course

in

Operating Room Principles and Advanced Practice.

The course commences in September of each year. Maintenance is provided, and a reasonable stipend is given each month. Enrolment is limited to a maximum of ten students.

For further information please write to:

THE DIRECTOR OF NURSING,
700 William Ave., Winnipeg 2.

ROYAL VICTORIA HOSPITAL

SCHOOL OF NURSING

MONTREAL, QUEBEC

Postgraduate Courses

1. (a) Six month clinical course in Obstetrical Nursing.

 Classes—September and February.

 (b) Two month clinical course in Gynecological Nursing.

 Classes following the six month course in Obstetrical Nursing.

 (c) Eight week course in Care of the Premature Infant.

2. Six month course in Operating Room Technique and Management.

 Classes—September and March.

3. Six month course in Theory and Practice in Psychiatric Nursing.

 Classes—September and March.

For information and details of the courses, apply to:—

Director of Nursing,
Royal Victoria Hospital,
Montreal, P.Q.

INDEX TO ADVERTISERS

MARCH 1964

COMMERCIAL

Abbott Laboratories Ltd. 219
Alconox Inc. 284
Ames Co. of Canada Ltd. 200, 201
Baxter Laboratories of Canada Ltd. 211
Becton, Dickinson & Co. (Canada) Ltd. 319
Bland & Co. 218
Boehringer Ingelheim Products (Div. of Geigy (Canada) Ltd.) 215
Brown Shoe Co. of Canada Ltd. 197, 320
Canadian Tampax Corp. Ltd. 217
Dept. of National Defense, Canada's Armed Forces 216
Charles E. Frosst & Co. 204
H. T. Heinz of Canada Ltd. 214
Hollister Ltd. 206
Ted Hoyer & Co. Inc. 202
Intra Medical Products Ltd. 203
Lakeside Laboratories (Canada) Ltd. 205
Lewis-Howe (Tums) 284
J. B. Lippincott Co. of Canada Ltd. Cover IV
C. V. Mosby Co. 210
Parke, Davis & Co. Ltd. 212, 213
J. T. Posey Co. 285
Savage Shoes Ltd. 207
Sterilon of Canada Ltd. 209
Trans-Canada Air Lines 208
Uniforms Reg'd. Cover III
Warner-Chilcott 193, 198, 199, 202
White Sister Uniform Inc. Cover II
John Wyeth & Bro. (Canada) Ltd. 220

PROFESSIONAL

Alberta 285
Bermuda 292
British Columbia 286
Children's Hospital of Washington, D.C. 312
Cornwall General Hospital 299
Dalhousie University 313
Dept. of National Health and Welfare, Ottawa 287
Extension Course in Nursing Unit Administration, Toronto 316
Hamilton Health Association 291
Hospital for Sick Children, Toronto 293
Humber Memorial Hospital 297
Jewish General Hospital 301
McGill University 315
McMaster University 316
Manitoba 288
The Mental Health Services, Essondale 316
Montreal Children's Hospital 316
Montreal General Hospital 317
N.Y. Polyclinic Medical School and Hospital 295
Nova Scotia 290
Nova Scotia Sanatorium 312
Ontario 290
Ontario Society for Crippled Children 289
Oshawa General Hospital 300
Quebec 292
Queen's University 314
Royal Victoria Hospital 317
St. Joseph's Hospital, Toronto 314
Saskatchewan 292
Scarborough General Hospital 297
Toronto General Hospital 295
U.S.A. 294
University of British Columbia 314
University of Western Ontario 313
Wills Eye Hospital, Philadelphia 314
Winnipeg General Hospital 301, 317
York County Hospital, Newmarket, Ontario 299

Classified advertisements are listed alphabetically

★ ★ ★

Advertising Representatives: Vanco Publications, 183 St. Clair Ave., W., Toronto 7, Ont.

Richard P. Wilson, 1 West Lancaster Avenue, Ardmore, Penna.

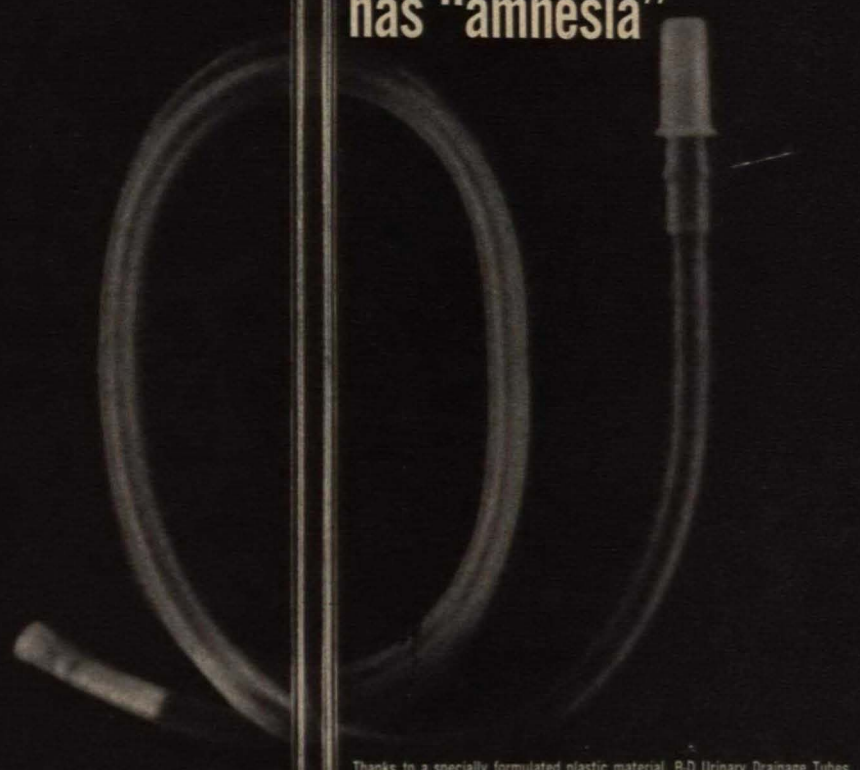
Address advertising enquiries to:

Advertising Manager, Ruth H. Baumel, The Canadian Nurse Journal

1522 Sherbrooke Street West, Montreal 25, Quebec

Member of Canadian Circulation Audit Board Inc.

this urinary drainage tube has "amnesia"



Thanks to a specially formulated plastic material, B-D Urinary Drainage Tubes lose all memory of ever having been coiled as soon as they're removed from their packages. This new soft formulation virtually eliminates twisting, turning, and kinking common to other plastic urinary drainage tubes.

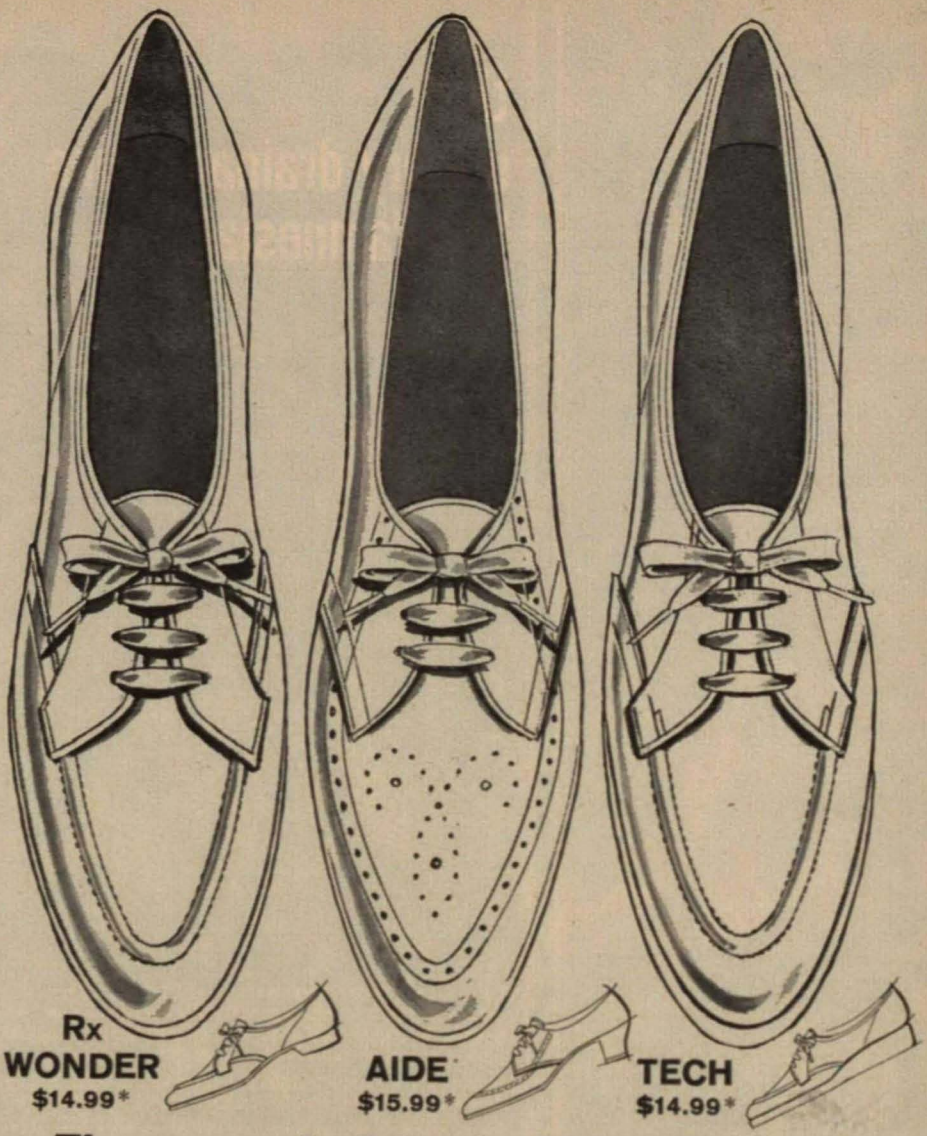
Result: Greatly increased patient comfort. For the drape of rubber, with the clarity of plastic, this soft formulation is also used on all B-D Connecting Tubes.

This urinary drainage tube is only one of many B-D Hospital Tubing Sets—a complete line is at your service. Write for information, or ask your B-D representative.

B-D

BECTON, DICKINSON & CO., CANADA, LTD., TORONTO 10, ONTARIO

a B-D product

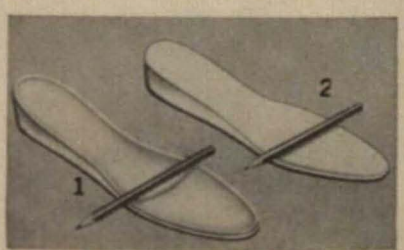


Three smart styles by Naturalizer—

and the smartest thing about them is their amazing Wondersole!

1 Wondersole is shaped to match the contour of the foot. Supports body weight evenly, over all parts of the foot. Lets you stand and walk longer without strain.

2 Ordinary insoles are flat. The ball and heel of your foot are forced to support the entire body weight. Feet tire easily.



Naturalizer

THE SHOE WITH THE BEAUTIFUL FIT

with

Wondersole ™

*Prices quoted are Suggested Retail Prices

For name of your nearest dealer, write:
NATURALIZER DIVISION, BROWN SHOE COMPANY OF CANADA, LTD., PERTH, ONTARIO

Heard the Word?



S-T-R-E-T-C-H
UNIFORMS!

UNIFORMS
REGISTERED
of Toronto

778 KING STREET WEST • TORONTO 2B, ONTARIO

1963 REVIEW and PREVIEW 1964



Smith & Gips — CARE OF THE ADULT PATIENT: Medical-Surgical Nursing

Provides basic instruction for medical-surgical care of the individual patient, reflecting in many ways a realistic sensitivity to the nursing needs of the patient.

1521 Pages 347 Illustrations 1963 $10.80

Blake & Wright: ESSENTIALS OF PEDIATRIC NURSING



Completely revised edition of a text unequalled for perspective on normal child growth and development, reaction to stress, and the total nursing needs of children. 7th Edition, 1963 $8.00



Greisheimer & Troyer: PHYSIOLOGY AND ANATOMY

A "better-than-ever" edition in which the principles of physiology and the facts of anatomy are fully and clearly covered. 8th Edition, 1963 $9.00

Cooper, Barber, Mitchell and Rynbergen, with Greene: NUTRITION IN HEALTH AND DISEASE



A new cover-to-cover revision, streamlined in presentation and fortified by the latest research findings. "TEACHING NUTRITION IN NURSING" by Rynbergen and Greene, Instructor's handbook now available in a new 5th edition.

14th Edition, 1963 $7.50

For Publication During 1964

Weems: NEUROLOGIC NURSING — Summer 1964
Luros & Towne: ESSENTIALS OF CHEMISTRY — Ready April
Bennett: METHODS IMPROVEMENT IN HOSPITALS — March 1964
MacBryde — SIGNS AND SYMPTOMS: Applied Pathologic Physiology and Clinical Interpretation — Ready May
Hirschberg, Lewis & Thomas — REHABILITATION: A Manual for Care of the Long-Term Ill and Elderly — Spring 1964
Henderson: NURSING STUDIES INDEX — VOL. IV — early 1964



Brunner, Emerson, Ferguson & Suddarth: TEXTBOOK OF MEDICAL-SURGICAL NURSING

A new text of major importance stemming from the fusion into a single volume of the classics ESSENTIALS OF MEDICINE and SURGICAL NURSING.

February 1964 About $12.00

Wheeler & Volk: BASIC MICROBIOLOGY



A new introductory textbook presenting content upon which a scientific approach to effective patient care can be based. February 1964 About $6.25



Chaffee & Greisheimer: BASIC PHYSIOLOGY AND ANATOMY

A new introductory text for the student nurse. Scientific principles are clarified for the beginner by relating them to concrete clinical applications throughout the book. 622 Pages 371 Illust. January 1964 $7.75

Fuerst & Wolff: FUNDAMENTALS OF NURSING: The Humanities and the Sciences in Nursing



Expanded content and an attractive new format make this classic more useful than ever to the student. 3rd Edition, May 1964 About 6.50

Lippincott